CONTENTS

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JULY, 1857.

ORIGINAL COMMUNICATIONS.

MEMOIRS AND CASES.

ART. PAGE

I. Phenomena of the Capillary Circulation. By Austin Flint, Jr., M. D. - 13

II. On the Treatment of Scarlatina by the Diluted Acetic Acid. By B. F. Schneck, M. D., of Lebanon, Pa. - - - - - - - - - - 27

III. Cases of Partio-General Paralysis, or the Paralysis of the Insane. By Pliny Earle, M. D. - - - - - - - - - - - - - - - 36

IV. Reports of Cases treated in the Pennsylvania Hospital. By John H. Packard, M. D., late Resident Physician at the Pennsylvania Hospital. - 51

V. Statistics of Obstetrical Cases. By Daniel Pierson, M. D., Augusta, Ill. (Prepared for, and read before the Hancock Co. (Ill.) Medical Association, and communicated to the Am. Journ. Med. Sci. for publication, in compliance with a vote of the Society.) - - - - - - - - - 56

VI. Chlorate of Potash in Mercurial Stomatitis. By Thomas J. Gallaher, M. D., one of the Physicians to the Western Pennsylvania Hospital, Pittsburg. - - - - - - - - - - - - - - - 64

VII. Chlorate of Potash Injections in Leucorrhœa and Ulceration of the Os Uteri. By Bedford Brown, M. D., Caswell County, N. C. - - - 66

VIII. The Use of Water in the Treatment of Fever. By Isaac Casselberry, M. D., Evansville, Ind. - - - - - - - - - - - 68

IX. Does Pregnancy accelerate or retard the Development of Tubercles of the Lungs in persons predisposed to this Disease? By Edward Warren, M. D., of Edenton, North Carolina. The Dissertation to which the Fiske Fund Prize was awarded, June 4, 1856. (Published by request of the Rhode Island Medical Society.) - - - - - - - - - 87

REVIEWS.

X. Statistical Report on the Sickness and Mortality in the Army of the United States, compiled from the Records in the Surgeon-General's Office; embracing a period of Sixteen Years, from 1839 to 1855. Prepared under the direction of Brevet-Brigadier-General Thomas Lawson, Surg. Gen. U. S. Army, by Richard H. Coolidge, M. D., Assistant Surgeon U. S. Army. Washington, 1856. - - - - - - - - - - 119

ART. PAGE

XI. Traité Thérapeutique du Quinquina et de ses Préparations. Par P. Briquet, Médecin à l'Hôpital de La Charité, &c. &c. Deuxième édition. Paris, 1855.
Therapeutical Treatise on Cinchona and its Preparations. By P. Briquet, Physician of La Charité, &c. &c. Second edition, Paris, 1855. - - 142

XII. Traité de Chimie Anatomique et Physiologique, Normale et Pathologique, ou des Principes Immediats Normaux et Morbides qui constituent le Corps de l'Homme et des Mammifères. Par Charles Robin et F. Verdeil. 3 volumes, et Atlas de 45 Planches. Paris, 1855.
Treatise on Anatomical and Physiological Chemistry, Normal and Pathological; or of the Immediate Principles, Normal and Morbid, which constitute the Body of Man and of the Mammiferæ. By Charles Robin and F. Verdeil. 3 vols., and an Atlas of 45 Plates. Paris, 1853. - - 158

BIBLIOGRAPHICAL NOTICES.

XIII. A Claim of Priority on the Discovery of, and also the Naming of the Excito-Secretory System of Nerves. By Henry Fraser Campbell, M. D., of Augusta, Georgia, U. S. A., Member of the American Medical Association, etc. etc. 8vo. pp. 16. - - - - - - - - - - 177

XIV. Reports of American Institutions for the Insane.
1. Of the New Jersey State Asylum, for the year 1856.
2. Of the Pennsylvania Hospital for the Insane, for 1856.
3. Of the Pennsylvania State Hospital, for 1856.
4. Of the Western Pennsylvania Hospital, for 1856.
5. Of the Mount Hope Institution, for 1856.
6. Of the North Carolina State Asylum, for 1856.
7. Of the South Carolina State Asylum, for 1856.
8. Of the Indiana State Hospital, for 1856.
9. Of the Illinois State Hospital, for 1856.
10. Of the Missouri State Asylum, for 1856.
11. Of the California State Asylum, for 1855. - - - - - - - 180

XV. On Dysentery and its Treatment. By Henry Tiedemann, M. D., Member of the College of Physicians, and of the Academy of Natural Sciences at Philadelphia. 12mo. pp. 29. Philadelphia, 1857. - - - - 192

XVI. Clinical Lectures on Certain Diseases of the Urinary Organs, and on Dropsies. By Robert Bentley Todd, M. D., F. R. S., Physician to King's College Hospital. 8vo. pp. 283. Philadelphia: Blanchard & Lea, 1857. 197

XVII. On the Diseases of Women, including those of Pregnancy and Childbed. By Fleetwood Churchill, M. D., T. C. D., M. R. I. A., etc. etc. A new American edition, revised by the Author. With notes and additions by D. Francis Condie, M. D., etc. etc. 8vo. pp. 768. Philadelphia: Blanchard & Lea, 1857. - - - - - - - - - 198

XVIII. Manual of Physiology. By William Senhouse Kirkes, M. D., etc. etc. A new and revised American, from the last London edition. With two hundred illustrations. 12mo. pp. 584. Philadelphia: Blanchard & Lea, 1857. - - - - - - - - - - - - - 201

XIX. A Manual of the Detection of Poisons by Medico-Chemical Analysis. By Dr. Fr. Jul. Otto, Professor of Chemistry in Caroline College, Brunswick. Translated from the German by Wm. Elderhorsz, M. D., Professor of Chemistry in the Rensselaer Polytechnic Institute, Troy, N. Y. 12mo. pp. 178. New York, 1857. - - - - - - - - - 201

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES IN THE MEDICAL SCIENCES.

FOREIGN INTELLIGENCE.

Anatomy and Physiology.

PAGE

1. On the Physiological Mechanism of the Formation of Sugar in the Liver. By Cl. Bernard. - - 203
2. Researches relative to the Influence of Alkalies and Alkaline Carbonates in Destroying Glucose. By M. Jeannel. - - 205
3. On a but little known Function of the Pancreas, the Digestion of Azotized Food. By M. L. Corvisart. - - - - - - 206
4. Digestion and Absorption of Fatty Substances without the Concurrence of the Pancreatic Juice. By M. Colin. - - 206

PAGE

5. Alcoholic Fermentation. By M. Berthelot. - - - - - 207
6. On the Mode of Action of the Gastric Juice. By Dr. Blondlot. 207
7. Quantity of Air inspired at every 5, 15, and 30 minutes of the Day and Night, and under the Influence of Exercise, Food, and Medicines—on the Temperature of the Body, &c. By Edward Smith. - - - - 208
8. Complete Obliteration of the Thoracic Aorta. By Mr. Sidney Jones. - - - - 211

Materia Medica and Pharmacy.

9. Experiments on the Action of Pepsin. By Edward H. Sieveking. - - - - - - 212
10. Chemical and Physiological Properties of Pepsin. By M. Boudault. - - - - - - 214
11. Therapeutic Employment of the Pyrophosphate of Iron. By M. E. Robiquet. - - - 215
12. Therapeutic Properties of Iodide of Potassium. By MM. Demarquay and Gustin. - - 217
13. Employment of Amylene for Children. By M. Giraldes. - 217
14. External Use of Clay. By Dr. Betz. - - - - - - 217

Medical Pathology and Therapeutics, and Practical Medicine.

15. On the Diseases of the Army of the East during the winter of 1854-5. By Dr. Tholozan. - 217
16. On the Identity of the Specific Causes of Typhus and Typhoid Fever. By Dr. Gibbon. - - 220
17. Analysis of Fifty-two Cases of Epilepsy. By Dr. Sieveking. - 222
18. On the Curable Stage of Phthisis. By Dr. Edward Smith. - 224
19. Diagnosis of Apneumatosis (Pulmonary Collapse). By Dr. Graily Hewitt. - - - - 226
20. Rupture of the Heart. By Dr. O'Ferrall. - - - - - - 227
21. Diabetes and Saccharine Conditions of the Urine. By Dr. A. B. Garrod. - - - - - 229
22. On the Prevention of Constipation. By Prof. Phœbus. - 230
23. Lactic Acid a Remedy for Dyspepsia. By Dr. Nelson. - - 231
24. Creasote in Erysipelas. By Dr. Delarue. - - - - - 232
25. Iodide of Ammonium. By Dr. B. W. Richardson. - - - 232

PAGE

26. Liquor Sodæ Chlorinatæ as a Local Application in Smallpox. By Mr. John Gabb. - - - 232
27. Fumigations of Essence of Turpentine in Itch. By Dr. A. Anselmier. - - - - - 232
28. Progressive Fatty Degeneration and Atrophy of the Voluntary Muscles. By Mr. Leggatt. 232
29. On the Pathology of the Articular Cartilages. By Thomas Bryant, Esq. - - - - - 234
30. Unusual and Obstinate Form of Swelling. By Mr. J. L. Milton. - - - - - - - 235

Surgical Pathology and Therapeutics, and Operative Surgery.

31. Concussion of the Spinal Cord. By Dr. J. S. Hughes. - - 237
32. The Constitutional Origin and Treatment of Cancer. By Mr. Weeden Cooke. - - - 240
33. Necrosis of Cancer and its Consequent Enucleation. By M. Moullin. - - - - - 241
34. Subclavian Aneurism Cured by Displacing a Portion of its Fibrinous Contents. By Mr. Robert Little. - - - - 244
35. Ligature of Arteries in Suppurating Wounds. By M. Nélaton. 246
36. Forcible Extension and Rupture of the Uniting Medium of Partially Anchylosed Surfaces. By Mr. Brodhurst. - - - 246
37. Excision of the Head of the Femur and Floor of the Acetabulum for Caries combined with Febrile Abscess. By Mr. Henry Hancock. - - - - - 248
38. Treatment of Certain Diseases of the Knee-joint by the Operation of Resection. By Mr. Price. - - - - - - 249
39. Bony Union after Fracture of the Cervix Femoris within the Capsule. By T. Bryant, Esq. - 252
40. Ununited Fracture Remedied by Operation. By James Syme, Esq. - - - - - - - 252
41. Case of Myopathic Luxation. By Dr. Friedberg. - - - 253
42. Inflammation and Rupture of the Rectus Abdominis. By Virchow. - - - - - - 255
43. New Method of Operating for Impermeable Urethra. By Mr. Syme. - - - - - - 255
44. Excision of an Enlarged Third Lobe of the Prostate in a Lithotomy Operation. - - - 257
45. Vesico-Vaginal Fistula. By Dr. Jas. H. Sawyer. - - - 258
46. Valvular Nature of Strangulated Hernia. By Prof. Roser. 260
47. Herniotomy in an Infant seven weeks old. By Mr. Wm. Rayner. - - - - - - - 261
48. Ovarian Dropsy treated by Iodine Injection. By Dr. J. B. Brown. - - - - - - 261

Ophthalmology.

49. On the Employment of the Ophthalmoscope in the Investigation of Deep-seated Disease of the Eye. By Holmes Coote. - 261
50. Sympathetic Inflammation of the Globe. By Dr. R. Bell. - 263
51. Loss of Vision following the Blow of a Whip; Recovery. - 265
52. The Relation of Cataract to Heart Disease. By Mr. T. F. Jordan. - - - - - - 266
53. Ought both Eyes, when Cataractous and equally affected, to be Operated on at the same time? By Dr. John Sloan. - 267

Midwifery.

54. Puerperal Fever. By Prof. Murphy. - - - - - - 269
55. Saccharine Urine in Nursing Women. - - - - - - 271
56. Iodine in Vomiting in Pregnancy. By Dr. J. B. Schmitt. 272
57. Sterility. By Dr. Carl Mayer. 272
58. Involuntary Production of the Lacteal Secretion by Electricity. By Dr. A. Auber. - - - 273
59. Pregnancy in a Two-horned Uterus. By Dr. Lumpe. - - 273

Medical Jurisprudence and Toxicology.

PAGE

60. Death from the Inhalation of Chloroform. By Jos. Allen, Jr., Esq. - - - - - - - 273
61. Death from Amylene. By Dr. John Snow. - - - - - 375
62. Poisoning from the Application of the Belladonna Plaster to the Skin. By Dr. Wm. Jenner. - - - - - - - 278
63. A New Poison. By M. De Luca. - - - - - - 279
64. Alleged Mental Unsoundness associated with Old Age. - 280
65. Transformation of Amygdaline into Hydrocyanic Acid within the Body. By Prof. Kölliker and Dr. Müller. - - - 282

Miscellaneous.

66. Ophthalmological Congress. - - - - - - - - - - - 282

AMERICAN INTELLIGENCE.

Original Communications.

Note of the Delivery of a Female, one of whose Lower Limbs had been Disarticulated at the Hip-Joint, by Dr. Duffie, seventeen years since, for Morbus Coxarius. By John H. Packard, M. D. 283
Case of Fracture of the Pelvis during Pregnancy. By J. Whitaker, M. D. - - - - - 283
Ovariotomy Successful. By E. P. Bennett, M. D. - - - - 284
Death following the Inhalation of a Mixture of Ether and Chloroform. By R. Crockett, M. D. - 284
Mental Influence of Mother on Fœtus in Utero exerted through two successive Pregnancies. By S. L. Kerr, M. D. - - - 285
Case of Arrest of Development. By S. L. Kerr, M. D. - - 286
Case of Fibrinous Plugs in the Abdominal Aorta, Right Iliac, and Right Subclavian Arteries. By G. A. Wilbur, M. D. - - 286

Domestic Summary.

Excision of the Tonsils. By Dr. J. Mason Warren. - - - 287
Complete Dislocation of the Cervical Vertebræ. By Dr. Daniel Ayres. - - - - - - 289
Femoral Aneurism Cured by Veratrum Viride, Manipulation and Compression. By Dr. Geo. C. Blackman. - - - - 290
Paracentesis Thoracis. By Dr. Henry J. Bowditch. - - - 291
Chalk and Vinegar in Intermittent Fever. By Dr. Hodsden. - - 292
Gunshot Wound of the Heart and Stomach. By Dr. J. H. Grant. 292
Dislocation of the Femur reduced by Reid's Method. By Dr. T. G. McElbright. - - - 292
Wutzer's Operation for the Radical Reduction of Hernia. By Prof. Geo. A. Blackman. - - - 292
Spina Bifida, with Malformation of the Genitals. By Dr. S. Kneeland, Jr. - - - - - - 292
Treatment of Erysipelas with Tobacco. By J. G. Stephenson. - 292

THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES

FOR JULY 1857.

Art. I.—*Phenomena of the Capillary Circulation.*

By Austin Flint, Jr., M. D.[1]

The statements which I shall make from my own observation concerning the capillary circulation, are based upon examinations made from time to time during the past summer, nine of which have been carefully recorded. The recorded observations were made on the web of the frog, although I have made examinations of the various other parts where the circulation can be conveniently exhibited, to which I shall refer.

The microscope used was the large instrument of Nachet, and, unless otherwise stated, with a magnifying power of 165 diameters.

I shall first point out what I have found to be the most convenient methods of conducting examinations of the circulation in the frog, and then proceed to describe the various phenomena of the circulation as viewed by means of the microscope, and then draw my deductions from these observations.

The parts of the frog which I have subjected to examination, are the web of the foot, the tongue, the peritoneum, and the lungs. All parts but the peritoneum require to be examined by transmitted light, but, in examining the circulation in the latter situation, we are compelled to use reflected light.

It is exceedingly inconvenient to make observations while the frog has the power of motion, and in securing it to the frog-plate in a proper position, we are apt to interrupt or modify the circulation by constricting the vessels with the bands which we must use. Under these circumstances, we are not able to apply medicated solutions conveniently to the entire surface, and mechanical or chemical irritation of any part occasions struggles which greatly increase

[1] An Inaugural Dissertation laid before the faculty of Jefferson Medical College in February, 1857.

the difficulty of the experiment. By breaking up the medulla oblongata, or even the posterior part of the brain (for it is not easy to invariably reach the medulla without some practice), we are enabled to observe all the phenomena of the circulation with great facility, avoiding the necessity of forcibly retaining the frog in the desired position, with the consequent liability to constriction of the vessels and shifting of the field of observation. I shall hereafter refer to experiments of E. Brown Séquard, M. D., of Paris, and two of my recorded examinations, which show that observations of the circulation may be made with as much accuracy on a frog after the medulla has been destroyed, as though it had not been subjected to the operation. The operation may be performed by introducing a dissecting needle into the cranium, a line or two behind the eyes, passing it backwards and a little downwards to the articulation of the spine with the skull, and then thoroughly breaking up the medulla. The web of the foot may be examined in the following manner: We first break up the medulla oblongata in the manner just described, the frog will then remain perfectly motionless in any position. The web may be stretched over the opening in the frog-plate, and secured in position by means of pins; care being taken not to extend the web too forcibly, and to put no pins above the foot, but nearly at the extremities of the toes, as in either case the circulation may be disturbed. The part should then be moistened, and the lenses of the microscope protected from the evaporation by a glass cover, broken to fit between the toes.

The entire surface of the frog should be moistened from time to time with cool water.

The magnifying power best adapted to such observations, is one of from 150 to 200 diameters.

In examining the tongue, we draw it out of the mouth, and stretch it so as to form a thin transparent film, by means of the forceps and pins. The circulation may be exhibited in the peritoneum by merely exposing that membrane and examining it, with a power of 60 or 70 diameters, by reflected light. The process of exhibiting the circulation in the lungs of the frog is much more complicated and difficult than either of the preceding experiments, but when successfully performed, it is one of the most beautiful and curious demonstrations in the whole range of microscopic science.

Dr. Robert Willis, in his edition of *Wagner's Physiology*, refers to the appearances of the pulmonary circulation in the water newt. He directs that the newt be strangled after an inspiration. "The abdomen is then to be laid open, and the entire animal, being held in the hands, is placed upon a glass plate as a *porte-objet*, and one of the lungs brought into the field of view." He observes, however, that the circulation lasts but a short time. The frog appears to me to be a much better subject for this experiment, and as I have never seen the process of showing the pulmonary circulation in this animal detailed in the books, I shall describe it with some minuteness as practised by Prof. John C. Dalton, of New York, and as repeated frequently by myself.

In undertaking it, a large sized frog should be selected. After having broken up the medulla oblongata, a ligature is to be placed around the larynx in the following manner: The mouth being widely opened, the larynx is seen just in front of the œsophagus. A ligature is now carried just under the mucous membrane by means of a small curved needle. This is effected by making four or five stitches, the needle being introduced at the point where it came out at each preceding stitch, so that the ligature shall smoothly encircle the larynx, and its extremities emerge at the same point. This being done, a small blowpipe is introduced into the windpipe, and the ligature held in readiness to be drawn tight by an assistant when required. The lungs must now be moderately distended and the ligature tightened, at the same time removing the blowpipe. If the side be now carefully opened the lung will protrude, and may be examined by transmitted light.

It is very much more difficult to exhibit the circulation in the lungs than in any other part. The chief difficulties to be encountered are the following: First, it is no easy matter to fix the ligature properly around the larynx; but when we have done this, if we distend the lungs too forcibly, they will either burst or the circulation will be greatly impeded; and if we do not distend them sufficiently, they will not protrude when the side is opened. There is also always some difficulty in introducing the blowpipe, and its delicate orifice is often occluded by the secretion of the part. When we succeed, however, in exhibiting the circulation in the lungs, the capillaries are seen encircling the air-cells, which are quite large in the frog. This is an extremely beautiful and interesting sight—but more as a scientific curiosity than as a field for useful investigation. It was observed by Dr. Willis, and confirmed by Wagner and Gluge, that the transparent plasma which we find occupying the space next to the walls of the capillaries, in most situations, while the blood-disks occupy the centre, constituting the still layer of Kirkes, is not observed in the capillaries of the lungs; in other words, the vessels are crowded to their very walls with corpuscles.

For this remarkable deviation from a general law they offer no explanation.

I have never observed this peculiarity, as my attention was not directed to it when examining the pulmonary circulation. Those who believe the heart is solely instrumental in propelling the blood through the capillaries would not be able to account for this phenomenon; but it seems to me it can be explained in the following manner: The blood circulating in the systemic capillaries nourishes the tissues by the liquor sanguinis, and thus the attractive vital force operates on this constituent. The plasma then is nearest the tissues and next the walls of the vessels; but the pulmonary capillaries are for the aeration of the blood, a process which is effected by the globules and not by the plasma—since the great mass of blood is not sent to the lungs for purposes of nutrition, but for aeration; hence, the *globules*, which here feel the force of attraction for oxygen, occupy the space next the walls of the vessels.

Taking the view which I do of the causes of the capillary circulation, this explanation is satisfactory.

Before proceeding to describe minutely the phenomena of the capillary circulation, we will briefly consider the anatomical structure of the capillaries and of the blood.

M. Robin recognizes three varieties of capillaries. The first variety is from $\frac{1}{3600}$ to $\frac{1}{830}$ of an inch in diameter, and is composed of a transparent homogeneous membrane, $\frac{1}{25000}$ of an inch in thickness, with nuclei, and sometimes nucleoli, projecting into the calibre of the vessel. The nuclei are oval, with their longest diameter in the direction of the vessel. These are embraced under the head of the "true capillaries" of Prof. Kölliker.

The second variety, M. Robin describes as having two coats: the membrane with the longitudinal nuclei of the first variety, and, investing it, a second membrane with transverse nuclei. The diameter of the second variety varies from $\frac{1}{830}$ to $\frac{1}{333}$ of an inch. This variety also probably comes under the head of the "true capillaries" as described by Kölliker, though he does not mention the second investing membrane.

The third variety, M. Robin calls venules and arterioles, Kölliker, venous and arterial transitionary vessels. Their diameter is from $\frac{1}{33}$ to $\frac{1}{17}$ of an inch, and they have added to the two coats of the second variety a third coat of areolar tissue. It seems to me most convenient and proper to consider the first two varieties of M. Robin, or the "true capillaries" of Prof. Kölliker, simply as capillaries (their tunic being a prolongation of the inner coat of the arteries), and the third variety of M. Robin as venules and arterioles. We may easily distinguish the arterioles from the venules, by noticing that the arterioles give off branches, while the venules receive them; that the arterioles diminish in size as we follow them in the direction of the current of blood, while the venules increase in size.

The blood consists of a transparent plasma holding two kinds of corpuscles in suspension, called the red and the white, or colorless. In the human subject the red corpuscles are disks like pieces of coin, but thinner in the centre than at the edges. They have no nuclei, though the difference in thickness causes the centre to appear dark when the edges are in focus. They are $\frac{1}{3500}$ of an inch in diameter. The white corpuscles are larger than the red, being $\frac{1}{2500}$ of an inch in diameter; they are globular, white, and granular. If water be applied to them they are rendered transparent, and we can distinguish a nucleus. They are much less numerous than the red corpuscles. In the frog, the red corpuscles are oval and large, with a central rounded nucleus. They are $\frac{1}{1000}$ of an inch in their long diameter. The white globules are smaller and proportionally more numerous than in man. The blood-disks in nearly all animals are red by reflected light, but of a pale amber colour by transmitted light.

Having given an abstract of the anatomy of the capillaries and of the blood, we are prepared to consider the phenomena of the circulation in these vessels.

In a paper communicated to the *Medical Examiner*, August, 1852, by E. Brown Séquard, M. D., of Paris, entitled "Experimental Researches applied to Physiology and Pathology," I find some very interesting observations on the effect, or more properly the absence of effect, on the capillary circulation, of the section of various nerves. This observer, with the assistance of Dr. Siebert, found, "after the section of all the nerves (the sympathetic and cerebro-spinal) in the legs of a number of frogs, that there was no appearance of trouble in the capillary circulation, either in one hour or three or four days after the division of the nerves." He concludes, from another experiment, that the nervous action (that of the sympathetic as well as the cerebro-spinal nerves) is not necessary for the change of colour of the blood in the capillaries. It is proved, by this experiment, that the capillary circulation is not immediately dependent, in any measure, on nervous influence.

A curious fact has been observed by Bernard, viz: that, after a section of the sympathetic in the neck, the corresponding side of the face, and more particularly the ear, becomes warmer and more sensitive than the other side. The bloodvessels appear more numerous than before, and are enlarged. Brown Séquard has repeated this experiment, and concludes that the increase of temperature and sensibility is due merely to passive dilatation of the vessels from paralysis of their coats and consequent congestion. I have myself seen the experiment performed by Prof. Dalton, of New York, and concur with him in the opinion that the increase in temperature and sensibility is rather due to an exaggeration of the nutrition of the parts: for specimens of blood drawn from the two ears have been compared, and there has been found a marked difference in their actual chemical composition.

These considerations are interesting in connection with animal heat, as produced by the molecular changes in the various tissues, and appear, also, to bear in some measure on the subject of the capillary circulation.

I shall hereafter take the ground that the capillary circulation is, in a great measure, dependent upon an attraction of a chemico-vital character between the tissues and the nutrient fluid.

Now, if the nutrition of the part be augmented, the congestion is due to the greater attraction of the tissues for the blood, the capillaries being first affected by its influence. The nutrition *is* affected, because the blood actually undergoes greater change than on the other side. The capillary circulation, then, in this case, seems clearly to be in a measure dependent on the process of molecular regeneration and disintegration. There is no new action induced in the part, but simply an augmentation of the usual processes; and if this be so, a cause of the capillary circulation is the chemico-vital attraction of the tissues for the blood. The fact that there can be a greater supply of blood, circulating with greater force, on one side of the body than in the corresponding part on the other side, seems to me an insuperable objection to the idea that the heart alone circulates the blood in the capillaries; but I have anticipated, in some degree, the points which I shall hereafter consider more fully.

When I commenced to describe the manner of making observations on the capillary circulation in various parts, I asserted that destruction of the medulla oblongata had no appreciable effect on the capillaries. Brown Séquard has demonstrated, by experiment, that frogs are able to live perfectly well for three or four months after extirpation of the medulla, and that all the functions, except pulmonary respiration, continue to go on apparently as usual.

Before I met with these observations, I made two experiments with reference to the reliability of observations made on a frog after breaking up the medulla or the posterior part of the brain.

In my first experiment, the posterior part of the brain was broken up in an unsuccessful attempt to reach the medulla.

The circulation was observed for seven hours, and was but slightly retarded when the experiment was concluded. For the first two hours, the circulation appeared as usual. I have made numerous unrecorded observations on this point, and have always arrived at the same result, *i. e.*, I have introduced a dissecting needle at the back of the head, sometimes reaching the medulla and sometimes not, but always rendering the frog perfectly quiet and manageable; and I have been unable to discover any effects upon the circulation, or the phenomena produced by irritants.

After making this experiment, I made several dissections so as to be able to reach the medulla oblongata with certainty, and succeeded, in doing so, in making the following observations:—

I examined the circulation for five hours with the same results as in the preceding experiment, *i. e.*, there was no alteration from the appearances of the circulation in the uninjured frog, at least for the first two or three hours.

From these observations, added to my unrecorded experiments, I have no hesitation in asserting that observations on frogs after breaking up the medulla oblongata or the posterior part of the brain, are equally valuable with those made on uninjured frogs; therefore, all the subsequent observations were made after breaking up the medulla, unless otherwise stated.

Dr. Wilson Philip made an experiment which is interesting, though not throwing any light upon the causes of the capillary circulation. "While Dr. Hastings was observing the circulation, he crushed the brain by the blow of a hammer. The vessels of the web instantly lost their power, the circulation ceasing; an effect which we have seen cannot arise from the ceasing of the action of the heart. (Dr. Philip here refers to experiments by which it is ascertained that the blood will circulate for several minutes after the interruption of the heart-action.) In a short time the blood began to move, but with less force." I will here add the notes of a similar experiment performed by myself. The brain of the frog was crushed while Prof. Flint was examining the circulation, which was brisk and regular; the motion instantly ceased, but commenced again in a few seconds, though it proceeded more slowly.

This observation thus in every respect confirms that of Dr. Philip.

This, as I have before remarked, cannot be thought to show that the capil-

lary circulation is dependent upon nervous influence, but merely that a violent shock is able to arrest momentarily all the vital functions. In several of my observations, I have minutely recorded the appearances of the capillary circulation, and have noticed the following phenomena:—

Observation 4th. I examined the web of a young frog.

From a careful and prolonged examination, it is evident that there is a difference between the modes of circulation in the arterioles and the venules. The blood moves more freely in the former, and the motion appears to be dependent on an attractive force—this is not as evident, however, here as in the capillaries; there the blood shoots off to different parts of the tissues in a manner which cannot be dependent upon a "*vis à tergo.*" It also moves much more rapidly in some of the capillaries than in others, the velocity varying in the same vessel at different times. In the venules, the movement is more sluggish, the globules apparently crowding each other along, and, on careful examination, making a decided contrast to the movement in the arterioles. The number of colourless globules is greater in the venules; they adhere to the walls of the vessels, and appear to be pushed along by the central mass, moving very much more slowly, and occasionally remaining stationary for a time.

Obs. 6th. In this observation, the same points attracted attention as in the preceding one, and, in addition, the following phenomena:—

A small transverse capillary, admitting but a single globule at a time, was abruptly bent at a certain point. The globules passed along in single file, irregularly isolated from each other, and were bent nearly double in passing the sudden turn in the vessel. This caused the globules to present a singular appearance at this point; they seemed to move by volition, like animate beings. The motion of the globules, under the above circumstances, is supposed to denote an attractive force.

In several instances the walls of the vessels were distinctly seen; they were perfectly motionless, evidently taking no active part in the circulation. The darting of single globules through small vessels, at a velocity greater than the velocity of the circulation in the vessel from which they branch, was repeatedly remarked.

Obs. 7. The points noticed in Observation 4th were here confirmed. I was forcibly struck with the great difference in the velocity of the circulation in different parts of the field, both in vessels of the same size and of unequal sizes. I also remarked a difference of velocity in the same vessels, especially capillaries, at different times.

An attractive force is evident; a certain condition of the disks is necessary in order that the force should operate. This condition, we may presume, is effected by respiration.

The appearances of the capillary circulation in the web of the foot may be described in the following manner:—

When the web is subjected to examination after the plan already stated,

we have vessels of various sizes in the field, consisting of arterioles and venules which vary most in their diameters, and the true capillaries which are all of nearly equal diameters. The blood is seen coursing along the vessels with great rapidity, especially in the arterioles, where we may observe a slight pulsatory movement.

In the arterioles, blood moves with unvarying rapidity as a general rule; and here especially we notice a space next the walls of the vessels, which is not occupied by the red globules, but along which the colourless globules move at a diminished rate, appearing to have a tendency to adhere to the walls of the vessels, and sometimes even remaining entirely stationary for a time, to be pushed along again by the central mass. This constitutes the still layer of Dr. Kirkes.

The white or colourless corpuscles are much fewer than the red, and they move at least ten or twelve times more slowly than the central mass. On careful examination, I have been able to remark a decided difference between the circulation in the arterioles and the venules. In the latter the movement is not so rapid, the globules appearing to be impelled more by a "*vis à tergo*," and to feel less the "*vis à fronte*," which seems to operate in the arterioles. The comparative number of the white corpuscles is greater, but the "still layer" appears to occupy a smaller proportion of the calibre of the vessel.

In the true capillaries, the movements are less regular, and apparently dependent in a great measure on a force which acts directly upon them; the "capillary power," as it is designated by Dr. Carpenter. This will be more fully touched upon presently, when we consider the causes of the capillary circulation.

In the true capillaries, the blood moves in every possible direction, at different rates of speed in different vessels, also at different times in the same vessel. In one instance, I remarked a capillary branching from a vessel at an obtuse angle (that is, turning almost directly opposite to the current in the main vessel), and individual globules shooting through it with great rapidity. In many instances, I have observed an entire stasis in one or two of the capillary vessels, but it existed only for a moment, and then recommenced with its original vigour. Dr. Carpenter has remarked a stasis followed by a current in a direction opposite to the original one.

It frequently happens that a globule is caught at the point of junction of two vessels, and remains stationary until it is carried along by the current of blood. Globules are frequently bent upon themselves as they pass from one vessel to another, but as soon as the cause is removed, they regain their original conformation.

The walls of the vessel are motionless, and do not take an active part in the normal circulation, as was supposed by some of the older writers.

Pigment-cells are observed scattered over the field, and when they are very

numerous, obscuring the view of the circulation; therefore, it is best to select a light coloured frog for demonstrations.

The pavement variety of epithelium may also be seen.

This is a description of the capillary circulation as it appeared to me under the most favourable circumstances: more minute, but not otherwise differing from the ordinary description in works on Physiology.

We now come naturally to a consideration of the causes of the capillary circulation. I say *causes*, because I shall take the ground that it is not produced by a single cause, namely, the heart's contraction, as was supposed by the great discoverer of the circulation. While it may be that the action of the heart is sufficient to propel the blood through the whole round of the circulation, as is contended by Magendie, by Dr. Allen Thompson, in the *Cyclopedia of Anatomy and Physiology*, Dr. Kirkes, and others, I believe that there are other causes which operate, and are able to carry on the circulation unassisted, as was the case in the acardiac fœtus of Dr. Houston, reported in the *Dublin Medical Journal*, 1837, where, of course, the circulation was stopped at the birth of the child by the want of due aeration of the blood.

Harvey, followed by Magendie, Kirkes, and other eminent physiologists, supposed that the heart was alone concerned in the production of the circulation, and some very striking arguments were made use of to prove it. It is found that, under the most favourable circumstances, a very inconsiderable force is required to propel a bland fluid from the arteries through the capillaries and out again by the veins. The pulsative movements, which we observe under some circumstances in the capillaries, is also brought forward as an argument. Dr. Kirkes dismisses the subject with the remark that "there is no need of an hypothesis of any action of the capillaries for regular propulsion of the blood through them, nor is it probable they have such an office." This appears to me a most unphilosophical mode of treating a very important subject. The circulation of the blood is a process immediately necessary to existence, and even should we agree with him that the action of the heart is capable of carrying on the circulation, it would not be out of place to inquire if there were not some other force which also operates to this end, and could take on, in some degree, the function of circulating the blood, should the heart become weakened from any cause. We know that, in the performance of that essentially vital function, namely, respiration, we commonly use but about one-third of the entire capacity of the lungs, and though the lungs seem to be only aerating organs, they divide that function with the skin. We might as well say that, as the diaphragm is sufficient to carry on respiration, there is no need of supposing that there are any other respiratory muscles. It is the duty of the physiologist to endeavour to ascertain *all* the causes of any of the vital phenomena.

There are several phenomena which are difficult of explanation by the theory of the sole action of the heart in producing the circulation. In the first place, it is difficult to understand how the heart could impel the blood through the

second set of the capillaries in the portal system. Then the experiments of Dr. Dowler show that the blood probably circulates in the capillaries, in patients dead from yellow fever, after the heart's action has ceased.

In the frog, Dr. Carpenter asserts, and I have myself seen, that the blood will circulate in the capillaries after complete excision of the heart. Carpenter also mentions instances where the heart has suffered such a degree of fatty degeneration, or replacement, that there existed scarcely a trace of muscular fibre, and the circulation must have been chiefly dependent on the "capillary power." Hassal records a most remarkable phenomenon, namely, the continuance of circulation in a portion of the tongue which had been entirely detached from the organ. He states that, while examining the tongue of a frog, a small portion was torn off, which he placed between two plates of glass, and was astonished to see the circulation continuing in many of the smaller vessels with unabated vigour. This phenomenon he observed for several hours, in connection with several medical gentlemen, and, on examining it the next day, preserving it under water in the mean time, the circulation still continued to some extent. This seems almost incredible, but coming from such authority, the fact cannot be doubted. Hassal appears to have made no subsequent experiments with reference to this point. After seeing this statement, I made two or three experiments, and once saw a slight movement in a portion of the tongue entirely detached; these experiments were not made, however, under favourable circumstances, the weather being cold, and the frog in a state of torpor, until partially aroused by immersion in tepid water.

A case is mentioned by Dr. Carpenter of an acardiac fœtus which was subjected to examination by Dr. Houston, where the organs were tolerably well developed, with the exception of the heart, and the circulation could only be effected by the "capillary power." These cases which I have described, are amply sufficient to disprove the theory that the heart is the sole agent of the circulation. In addition to them, the phenomena of inflammation as seen under the microscope, the normal appearances of the capillary circulation, which appear to the eye to be in some measure dependent on an attraction of the molecules of the tissues for the blood; the experiment of the section of the sympathetic in the neck of the rabbit, which I have previously noticed, and which produced an augmentation of this attractive force in the corresponding ear and side of the face, and comparison with the circulation in some aquatic plants, which we know is not dependent upon the action of a heart, all these go to prove that the heart alone does not produce circulation.

Prof. Draper, of the University of New York, has put forward a theory in regard to the circulation, which makes the heart of minor importance. His is the theory of capillary attraction and affinity. He starts from the proposition that, "if two liquids communicate with each other through a capillary tube, for the substance of which they have affinities of different intensities, movement will ensue; the liquid having the highest affinity will occupy the tube, and may even drive the other from it; the same effect will ensue in a

porous object." He believes that this is the great cause of the circulation, namely, an affinity between the blood and the tissues; that thus the blood is forced into the veins, and that the action of the heart is limited to filling the arteries and presenting a supply of blood to the capillaries. The blood circulates in the lungs chiefly from its affinity for oxygen.

This theory cannot be sustained. The heart undoubtedly has a much more important office in the production of circulation. When we cut a small artery, we see the blood forcing itself in a jet to a distance of several feet; and this happens after it had entirely lost the influence of the capillary force. The illustration of Prof. Dunglison, namely, the law that fluids confined in tubes will rise to the same level, and that thus the blood in the veins, by a simple hydrostatic principle, would rise as high as the right auricle in a line with the blood in the left ventricle, shows how slight a force from the heart would be propagated through the capillaries to the veins, and be sufficient to return the blood.

Dr. Dowler, of New Orleans, believes in a distinct capillary action. In some of the experiments which he adduces in support of his position, and which are noticed by Dr. Dunglison in his *Human Physiology*, bodies of yellow fever patients were carried to the dissecting room a few moments after death. "The external veins sometimes became distended, and when punctured, the blood flowed in a good stream; the operation of bleeding at the arm was imitated, and as the muscles were moved, the blood shot forth for some distance." Other experiments on the veins, of a similar character, are recorded by him.

These observations seem to show that there is some action in the capillaries after death, and inferentially during life, which is independent of the heart's action. The entire emptying of the arteries after death cannot be perfectly explained by the mere contraction of the vessels.

What causes seem to operate to produce the capillary circulation, judging merely from the appearances under the microscope? In the observations which I have recorded on this point, we have noted an irregularity of the movement in the capillaries, both in different vessels at the same time, and in the same vessel at different times; the irregularity sometimes amounting to entire cessation of the circulation in a single vessel, and then a current in an opposite direction; a shooting off of single globules through vessels which were before empty, the darting off of globules through capillary branches with a velocity greater than that of the blood in the main vessel; and in short, all the phenomena which are presented to the eye, seem to indicate that there is an attractive force, resident in the solid particles, which operates on the blood in the capillaries.

We are not supposing the existence of a force with the operation of which we are unacquainted. The present school of physiology teaches us that the processes of nutrition, of molecular disintegration, and of secretion, are dependent on a vital force resident in the solid particles of the organism, which are

essentially vitalized. Inflammation is now supposed to be due to a perversion of this force.

In what other way could we explain the fact that every tissue takes from the mass of arterial blood the substances which are required for its nutrition. The blood sent to the systemic capillaries by the heart is the same in all parts of the body, but when the great change which is effected in the capillaries has taken place, we find that the blood which has thus been rendered venous is not the same in all the veins; for example, the blood in the renal vein is almost as florid as arterial blood.

The existence of a distinct capillary action is now believed by the highest authorities. Lehmann believes that a chemico-vital attraction of the blood for the tissues, together with the physical capillary attraction, produces the movement of the blood in the capillaries, and forces it into the veins. Dr. Carpenter believes that there exists a "capillary power" which is superadded to the force of the heart. Prof. Dunglison teaches that there is an independent power resident in the tissues about the capillaries, and that, "by the united action of the heart, arteries and capillaries, or intermediate system of vessels, the blood attains the veins." Even those who recognize the heart as the only efficient organ of circulation yield that the capillaries possess a "distributive force;" that is, though the circulation is effected by the heart's unassisted action, that the tissues have an attraction or affinity for the blood, which distributes it for their nutrition to each and every part of the body.

Taking into consideration everything which I have seen bearing on this point, it seems to me to be clearly proved that the normal capillary circulation is dependent, in the first place, on the action of the heart. It cannot be denied that the heart has a considerable share of the duty of capillary circulation. Taking into account the conditions of the blood and vessels, apparently a slight force is capable of propelling the blood through the capillary system. When a small artery is divided, the force with which the blood pumps out is considerable, and appears sufficient to exert a decided effect on the motion of the blood in the capillaries. It is impossible to estimate with much accuracy the proportional influence which the heart has in producing capillary circulation. The vital affinity between the tissues and the blood, which I suppose to be the other power concerned in this function, never ceases; still, as the action of the heart is frequently much interfered with, as in cases of excessive fatty degeneration, and as the heart has been removed from the frog, the capillary circulation nevertheless continuing, we cannot think that its power is greater than the attractive force, or Carpenter's "capillary power," which I hold to be essentially concerned in the performance of this function. The value of the heart's action is also variable, both in different individuals, and in the same individual at different times.

The only other force which has any share in the production of the capillary circulation, unless it be a slight suction force from the veins, is the "capillary power." This seems to me to play the more constant and effective part.

When this ceases to act the animal dies, and the blood refuses to circulate in spite of the heart. This is the great vital force of nutrition which is constantly operating, and which is so wonderful and inexplicable. We know the fact that there is such a force, and that it continually acts, but what it consists of, or what is its essential character, is beyond the wisdom of man to explain. It is life. Lastly, the following inquiry suggests itself: What conditions are necessary to the healthy performance of the capillary circulation?

First, a healthy condition of the vital particles, which is produced by healthy nutrition. Secondly, a particular condition of the blood, which is produced by respiration.

No arguments appear to be necessary to prove the former statement, but I have made experiments, which I shall proceed to describe, which conclusively establish the second point.

The following experiment, made by Dr. J. Reid, and reported in the *Edinburgh Med. and Surg. Journal*, April, 1841, is quoted by Dr. Carpenter:—

Dr. Reid found that when the ingress of air through the trachea of a dog was prevented, and the asphyxia was proceeding to the stage of insensibility, the pressure in the femoral artery, indicated by the hæmadynamometer, was much greater than usual.

Upon applying a similar test to a vein, however, the pressure was proportionally diminished, whence it became apparent that there was an unusual obstruction to the passage of the venous blood (the blood being venous in the arteries) in the systemic capillaries.

Before seeing an account of this experiment, I had made the following observations, carefully recording them, with reference to the same point:—

Obs. 1*st.* The medulla of a middle sized frog was broken up, and the web submitted to microscopic examination. The frog was bathed with sulphuric ether, care being taken not to allow any to touch the web under examination, and the circulation was watched for ten minutes. No effect could be discovered. The object of this experiment was to determine whether the phenomena in the succeeding experiment were in any degree dependent on the ether which is contained in collodion. The frog was then painted over with an impermeable coating of collodion, care being taken as before not to touch the web. The effect on the circulation was immediate. It instantly became less rapid, until, at the expiration of twenty minutes, it had entirely ceased.

The smaller vessels were the first to become affected, the larger arterioles resisting it longest. One of the first effects was a pulsative movement in vessels where the blood had previously flowed in a continuous stream, showing, as it seems, *that the attractive force is lost, but that the heart's action is felt.* The fact of the first arrest of the blood in the capillaries, seems to indicate that the blood is now unfit to supply wants of the tissues, and that the attractive force ceases to be operative. The arrest of the circulation was steady, and at the expiration of twenty minutes the motion had entirely ceased.

The entire coating of collodion was now instantly peeled off, and the effect on the circulation was instantaneous. Quite a rapid circulation immediately commenced, but it soon began to decline, and in twenty minutes had almost ceased. The heart was now exposed, and found contracting regularly. In this experiment, all respiration was abolished, the medulla being broken up, and an impervious coating applied to the entire surface.

Obs. 2*d*. I painted a frog with a thick coating of collodion, without destroying the medulla. It struggled vigorously at first, but soon became quiet, and the web was put under the microscope.

The circulation was affected in the same manner as in the preceding experiment, and entirely ceased in twenty-five minutes.

During the first few minutes, the nostrils dilated and contracted rapidly, but soon became motionless. Care was taken not to obstruct the nostrils with collodion, though it was applied effectually to all other parts excepting the foot under observation.

The experiment of Dr. Reid proves the fact inferentially, namely, that the blood, deprived of oxygen, as in asphyxia, is retarded in the systemic capillaries; but the experiments just related, bring the processes directly under the eye, and we can see clearly that when the blood is not aerated it will not circulate, though the heart contracts, and that it is retarded in the capillaries. My second experiment demonstrated the comparatively small part which the lungs of the frog take in respiration; the blood circulating in the frog, in which the pulmonary respiration was not interfered with, only five minutes longer than in the frog after destroying the medulla. Capillary circulation will go on in the lungs of the frog after tying the trachea, as I stated when describing the circulation as seen in various parts of the animal, the blood being sufficiently aerated by means of the skin.

Thus it is experimentally proved that an oxygenated state of the blood is an indispensable condition for its circulation through the capillaries. When the process of respiration or aeration of the blood is established, the blood cannot circulate. This we know to be the fact, but we demonstrate, by the preceding experiments, that, in asphyxia, the impediment to the circulation takes place in the capillaries; that the condition of oxygenation is necessary to the performance of the vital functions, and it may be that the entire want of the "capillary power" throws all the onus on the heart, and that the heart is insufficient for the labour. In one of my experiments, after the capillary circulation had entirely ceased, the chest was opened, and the heart found beating regularly.

Art. II.—*On the Treatment of Scarlatina by the Diluted Acetic Acid.* By B. F. Schneck, M. D., of Lebanon, Pa.

During the past twelve or fourteen months a severe epidemic of scarlatina has prevailed in my neighbourhood. Of 190 cases of the disease treated by me in accordance with the method recommended by our best authorities, I lost 1 in 8½ to 9.

Dissatisfied with this result, I was induced to try the diluted acetic acid as recommended by Dr. I. B. Brown, whose work[1] I had the good fortune to meet with at the commencement of the present year. Of 60 cases treated subsequently by this plan, I did not lose one. The disease at this time had not undergone any abatement from its former violence; for among the sixty recoveries there were cases of such malignancy, as would inevitably have perished under the best directed previous efforts. It is true that two of the sixty afterwards died of thoracic and cerebral dropsy; and one, after a nearly two weeks' convalescence, from purpura hæmorrhagica, with epistaxis, hæmaturia, &c.; but these cases cannot be regarded as affecting the integrity of the plan in question. I am thus enabled to bear a flattering testimony to the success of Dr. B.'s method.

Many medical men, after unsatisfactory trials of all the ordinary modes of treatment, now declare that the less there is done for scarlatina the better. All such will be apt to think lightly of Dr. Brown's method; if, indeed, they do not condemn what they may choose to call his *nimia cura medici*. Let such rest assured, however, that this is a disease which, like weeds, flourishes most when least attended to; and further, that the character of medical adviser must be merged, for the time, in that of nurse also, to a certain extent, if his ministrations are to be successful. He should see his patients several times in a day—the oftener the better; and, following the example of our author, he should even be found holding nightly vigils by the bedside, if the urgency of the case required it. The daily dressings of the fauces with caustic should, if possible, be made by himself; he should direct the frequency of the repetition of stimulants; and even the minutest details should ever be under his immediate cognizance. Thus fully occupied, although he may be able to take charge of fewer patients, he will save more lives; and only thus will he be able to realize the truth of the otherwise almost incredible statement of a friend of the author's engaged in extensive practice, who writes, "that the number of fatal cases occurring to him under this treatment did not exceed *four*." This gratifying result, it is the writer's firm conviction, will be the reward of all who will adopt and faithfully carry out the plan.

[1] On the Treatment of Scarlatina by the Acidum Aceticum Dilutum of the Pharmacopœia. By I. B. Brown, M. D. London, 1846.

The following is a synopsis of Dr. Brown's views:—

1. Scarlatina is always and essentially a disease of debility, or tending to debility, and not of an inflammatory nature. Its poison acts primarily and most fatally upon the blood, producing a dissolved, semi-vitalized and putrescible condition of that fluid; so that it posesses more serum and less fibrin than in its normal state. "Consequently the serum percolates, or is effused into the cellular tissue and cavities, through the coats of the vessels. Salines favour this dissolved state of the blood; but acetic acid prevents the separation of the serum from the fibrin."

2. Acetic acid is an excellent antiseptic; "it gives tone to the blood in scarlatina, and prevents the separation of the serum from the fibrin." It also "acts as an astringent upon the lymphatic system and serous membranes, and so effectually prevents dropsy."

3. It is a grateful refrigerant.

4. No medicine has a more decided influence in promoting digestion than this acid. We are further directed, while administering it, to "allow patients almost anything they fancy; it will seldom hurt them in severe and even dangerous disease."

These four points lie at the foundation of Dr. Brown's very simple and very successful treatment. The specialities of his method will now be given, as applicable to the several forms of the disease.

Whatever may be the type, he prepares the system for the acid, by giving

1. *An aperient* of 3 to 5 grs. of calomel, to be followed in two hours by castor oil. All *saline* aperients are condemned; "salines favour a dissolved state of the blood." If, from great gastric irritability, the oil is rejected, he recommends an *aperient mixture* (rhubarb and magnesia), *which contains no saline substance.*

2. Apply a piece of flannel round the throat from ear to ear, saturated with soap lin. f℥j; camphor lin., laudanum, āā ℥ij.—M.

3. After the operation of the oil, give—for a patient nine years old—distilled vinegar, *diluted*,[1] f℥j; syrup f℥iv; distilled water f℥iv.—M. Two tablespoonfuls every four hours. This mixture is to be continued throughout the entire duration of the case, whatever the form of the disease; and for one or two weeks afterwards, or until desquamation is well over. "It acts as an astringent upon the lymphatic system and serous membranes, and so effectually prevents dropsy."

4. Whenever, in scarlatina simplex, there is slight delirium in the beginning, with *a thick, viscid phlegm on the tonsils*, apply daily—nitr. silver grs. x; distilled water f℥j.—M. You thus prevent s. anginosa. If the throat require it, a linseed poultice may be placed over the flannel, and kept there constantly.

5. On the third or fourth day, in simple cases, allow mutton-broth.

[1] ℞.—Distilled vinegar, offic., one part; water, seven parts.—M.

6. As soon as desquamation comes on, order a warm bath or two, and keep the patient strictly in bed during the whole process.

S. Anginosa.—Here the treatment is the same, except that the caustic must be used more frequently, and the proportion of acid in the solution must be increased. A good rule is to increase the strength according to the violence of the attack, in bad cases giving it as strong as the patient can take it. Poultices to throat. Should symptoms of adynamia come on, give arrowroot, with a spoonful of brandy in it; add comp. sp. ether to acid solution; wash face, hands, legs, and chest with tepid vinegar ($\frac{1}{4}$) and water ($\frac{3}{4}$). If restless at night, give tinct. hyoscyam., or $\frac{1}{8}$ to $\frac{1}{4}$ gr. morphia, according to age. The decoction of bark may also be added to the acid mixture. Whenever, in s. anginosa, symptoms of adynamia come on, dress the throat frequently with caustic, and increase the quantity of acid from day to day; you thus prevent s. maligna.

For adults, in cases partaking of the nature of s. maligna, the following formula is given: ℞.—Distilled vinegar f℥iv; syr. red poppies f℥iv; distilled water f℥iv.—M. One-fourth part to be taken every four hours.

In *s. maligna* the same course of treatment is to be pursued; calomel, oil, caustic, acid mixture (strong), liniment or sinapism to throat, followed by poultices; brandy or port wine every four to six hours, with arrowroot, beef-tea, or mutton-broth; morphia at bedtime, or whenever restless, and sponging with tepid vinegar and water. All the bed furniture, carpets, &c., to be removed from the room, and chloride of lime to be sprinkled about the floor. During desquamation, the patient is not to sit up at all. Give at this time one or more warm baths. Use wine and brandy in s. maligna, even in the febrile stage; when combined with the acid, which so powerfully assists digestion, no harm will ever accrue from their use.

This is a brief statement of Dr. Brown's views and practice in this terrible malady. To the work itself we must refer for a number of valuable cases, illustrating most happily the treatment which he advocates, and interspersed with many highly practical remarks. I cannot help transcribing at length, as a fitting close to this portion of the subject, the following observations, which I have copied from his work:—

"Very much depends on careful watching in this disease; there is always, in one or the other of the stages, a *critical moment.* For instance, in the eruptive stage, even in s. simplex, delirium will come on, and the throat will become more clogged with viscid secretion in a few hours; and if attention be not promptly given, and this phlegm, which impedes free respiration, be not removed, the delirium and laborious breathing will increase, and the disease will soon run into the second or anginose form. In this case, the throat must be promptly cleansed, and some gentle nourishment be given. Again, in s. anginosa, it will not seldom happen that the tonsils and fauces will suddenly become worse, or great sickness or sudden prostration will come on; now, unless the throat be instantly attended to, delirium, laborious breathing, difficult deglutition, and restlessness will make serious ravages upon the patient, and all remedies will quickly become unavailing; or, where sudden prostration should arise, then we

must promptly and unsparingly administer stimulants and cordials till the pulse exhibits more steadiness and power."

The practical importance of these directions cannot be over-estimated. As assisting the cleansing of the fauces from viscid secretions, I have, for several years past, been in the habit of injecting the diluted chlorinated soda into the nares, with the happiest effects. Extensive ulceration, not only of the posterior nares, but of the entire nasal tract, with an abundant secretion of a peculiar tenacious mucus, are an attendant on every bad case; and these passages cannot be long obstructed without great distress and imminent danger. The daily or bi-daily injection of Labarraque's solution, therefore, while it effectually clears away the obstruction (as any other liquid would as well), exerts besides an alterative and healing influence upon the ulcerated surface itself; and it *destroys*, while it removes, the morbid products which, if swallowed, as they are otherwise sure to be, disturb so seriously the intestinal canal; and last, but not least, it corrects the fetor which is so disagreeable a concomitant of such cases. So signal is the relief derived from this procedure, that, unpleasant though the sensation must be, I have seen the little patients, instead of shrinking from the operation, instinctively court the repetition of it, and if old enough, ask for it. It is a measure which, in the class of cases referred to, cannot be dispensed with, without loss. But as it may happen that a considerable quantity of the injection may be swallowed, and the blood be thereby impaired, it will be proper always to precede or follow the injection with a strong dose of acetic acid, so as to neutralize the saline ingredient.

The preparation of the acetic acid solution may be varied somewhat from the formulas given above, and so simplified, without in the least affecting the result. Instead of first diluting the concentrated acid to the strength of vinegar, and then using the dilution for the preparation of the solution, I have been accustomed merely to add from ʒj to ʒiv of the officinal acid to fʒiv water, and ordering a tablespoonful overy few hours, sweetening at the time of administering it. We must, however, never forget to increase the strength in proportion to the threatening nature of the symptoms.

In the use of stimulants, also, a little license has been taken with our author's directions. Having ventured upon the guarded employment of brandy, beef-essence, &c., as a precautionary step, earlier in the attack than he allows, without detriment, I now administer brandy in graduated doses, two or three times a day *from the beginning* in the malignant form, or on the second or third day in anginose cases; and I have seen no reason to regret this course. If the tongue becomes red like a strawberry, with the papillæ as large as a pin's head, or on the contrary, brown, dry, fissured, with sordes on the teeth; and if there be, besides, a recession of the eruption, a pulse fluttering and not to be counted, or even delirium, "then we must unsparingly administer stimulants and cordials, until the pulse exhibits more steadiness and power." Carb. ammonia, quinia, and even capsicum, have here all failed me;

this last having proved alike ineffectual as an arterial stimulant, and as a local application to the fauces.

If scarlatina were an inflammatory disease, as the advocates of bleeding and antiphlogistics would have us to believe, such a stimulant course could not fail to result disastrously in nearly every instance; but the reverse is actually the fact. The violent excitement in severe attacks, as indicated by burning skin, rapid pulse, delirium, &c., is not an evidence of phlogosis, but of irritation. And when death takes place in such cases, it is not so much from inflammatory disorganization of any vital part, as from sheer exhaustion; the inevitable consequence of the excitement into which the system had worked itself, in its vain struggles against the fatal poison which was oppressing it.

Dr. Brown's silence in regard to the use of emetics is a significant fact; although more celebrated authorities than he, recommend them highly. Their adoption at all, as part of the treatment, was probably suggested by the nausea and vomiting which almost always usher in the attack; under the supposition of the presence of acrid ingesta, which they were designed to remove. It may be, that when the mildest article is selected, solely with this view, they may do no harm; but when administered indiscriminately, fatal results must occasionally follow the practice.

Dentition, improper food, the hot months, and a hereditary predisposition, may all, in scarlatina, favour the occurrence of serious gastro-intestinal disease, from the least exciting cause; and an emetic, especially if containing tart. antimony as advised by some, may be this cause. In the month of July, 1856, I was called to see a child aged 20 months, ill with s. anginosa, running into maligna, with scarcely any eruption. Notwithstanding the child had vomited, an emetic of ipecacuanha with calomel was given, after a warm bath; to be followed by sp. nitric ether and bicarb. soda in solution, with capsicum infusion. The vomiting became unmanageable, attended with a copious diarrhœa; gastritis supervened, with peritonitis and enormous abdominal distention; and on the fourth day the child died in convulsions. The emetic most probably had killed it.

What, let us ask, does the gastric irritability of this disease mean? Is it not the first appreciable alarm given by nature of the introduction of the poison, and an ineffectual attempt on the part of the system, to get rid of it at the outset? But as the morbific matter is introduced, and the blood saturated with it, many days it may be before it actually develops itself, how can we expect emesis, whether spontaneous or artificial, to dislodge it? If, instead of vomiting, scarlatina began with diarrhœa, would we be justified in giving an active purgative, with the same object? Assuming Dr. Brown's view to be correct, would it not be malpractice to bring to bear the depressing effects of a nauseating emetic upon a disease whose tendency from the beginning is towards debility? The unfortunate result above related has convinced me that the use of emetics, as a matter of routine, is fraught with great danger; and

that their employment is indicated in very few, and very special cases, if at all.

The following cases, representing the worst forms of s. anginosa and maligna, are selected out of a number of similar ones, from my case-book, as illustrating the gratifying success of the acetic acid treatment, even when under the most unfavourable circumstances.

Case I.—*Dec.* 27, 1856. Saw a girl of Jos. Heilman, aged 13, in an attack of *s. ang. threatening maligna.* On the evening of the 28th found more fever, very frequent, angry pulse, constant sighing and heaving of the breath, with increased impulse of heart. Suspicion of pericarditis, and tempted to bleed. Concluded to postpone till next morning; ordering sinapisms to extremities, and dose calomel. Was prevented from seeing her until next day towards evening.

29*th.* Pericarditis now clear. Bled viii oz.; epispastic to left chest; cal. and op. āā ½ gr. every 2 hours; sinapisms to extremities. Eruption well out. Teaspoonful brandy at one, to be continued 3 or 4 times a day, with beef-essence.

30*th.* Effusion around heart; impulse scarcely perceptible to hand, or audible; at times delirious; eruption well out; slight epistaxis. Inunction with mercurial oint., and same to blister. Continue remedies.

31*st. Morning.* Pulse more full, and a shade slower; impulse of heart more perceptible, and less muffled; had 3 or 4 evacuations. Continue treatment, with alternate doses of pulv. scillæ and digital., āā ½ gr., cal. ¼ gr.

Evening. Cardiac trouble decidedly better; but alarming prostation, from epistaxis to the extent of a pint. Partial coma; tongue dry, and papillæ very much elevated; four alvine discharges. Cold cloths to head and neck; Dover's p. 3 grs., digital. ¼ gr., acet. lead ½ gr. every 2 hours (having omitted former powders); 10 drops elix. vitriol every 2 hours. Sinapisms to extremities; iced lemonade for a drink; may die to-night.

Jan. 1, 1857. *Morning.* Bled a pint or more at two several times, to-night; extremely exhausted; but one dose of the medicines ordered last evening was given; family expecting her death hourly. This being contrary to my express orders, I at once directed a resumption of the treatment, including brandy and essence of beef.

Evening. Has taken remedies all day; no bleeding. Pulse a little fuller, and slightly slower. Tongue dry, and covered with crusts of blood. Eruption apparently about to decline on upper part of body, but well out on lower extremities. Continue treatment, at three hours' interval.

2*d*—*Noon.* Pulse a little slower; circumscribed flush on each cheek; face sunken; tongue very dry; skin dusky, and whole case *typhoid.* Turpentine emulsion and elix. vitriol, with beef-essence, and brandy and milk.

3*d.* Tongue a little more moist. Continue remedies.

4*th.* Improving; pulse a little slower. Will recover.

5*th to* 6*th.* Has great appetite. Slowly convalescent.

Remarks.—Bleeding, in scarlet fever, is not necessarily an injurious measure, especially if its otherwise depressing effect be guarded against, immediately afterwards, by suitable doses of stimulants and nourishment. In this instance, the venesection most assuredly saved life, by moderating and favouring the resolution of the cardiac inflammation; which, although it had gone

on to the effusion of serum, was nevertheless relieved by it, and by the subsequent use of squill, digitalis, and calomel. The recession of the eruption, which might otherwise have followed the bleeding, was also prevented by the prompt administration of small doses of brandy. In a similar case of pericarditis in the course of scarlatina, I should feel emboldened to bleed largely, giving stimulants and beef-tea generously immediately afterwards, as the only mode promising success.

Case II.—*S. Anginosa running into Maligna.—Dec.* 30, 1856. Girl of Geo. Strohm, aged 4 years. Vomiting; very rapid, irritable pulse; eruption of a vivid red colour; tonsils greatly enlarged, and covered with lymphy exudations. Solid caustic to throat; cal. oil, and strong acid solution.

Jan. 1, 1857—*Morning.* Symptoms of great malignancy; fauces of a dark purple hue; face mottled with *white* patches, where the eruption showed a disposition to recede; excessive restlessness all night, getting out of bed in the delirium; surface of an intensely deep red colour; pulse rather feeble, and slow. Solid caustic to throat; sinapism externally, to be followed by poultices. Teaspoonful of brandy every five or six hours, if not gone to sleep. Beef-essence; acid solution stronger.

Evening. Has slept some hours; face more uniformly red; pulse more frequent; surface hot. Sol. 10 grs. nitr. silver to ℥j water, to fauces twice a day; chlorinated soda injections into nares. Continue remedies.

2*d.* Same as last evening. Comp. camph. lin. to throat, which is much swollen; caustic, injections, brandy, and beef-tea.

3*d.* Desquamation already beginning on different parts of the body, being only the fifth day—a bad sign. Continue remedies.

4*th.* Throat very much swollen externally; tonsils deeply ulcerated; case very malignant; sinking, and very restless; surface pale and cool.

10 *P. M.* Was sent for; supposed to be dying. Prognosis very bad. Solid caustic to throat; injection into nares; brandy every two or three hours, and continue remedies.

5*th.* Pulse a shade slower. Family did not attend to throat this morning. Applied caustic at once, and injected chlor. soda into nares, bringing away large masses of viscid secretions, with great relief. Quite rational.

6*th to* 10*th* Pulse slower. Gradually convalescent.

Remarks.—This case exhibited what I have repeatedly seen in this epidemic—a succession of pure white patches in the midst of the eruption, on the face most generally; appearing in the course of a few minutes, and persisting sometimes for half a day, or longer. Having met with this symptom only in cases of a malignant character, with a cool skin, and other signs of adynamia, I have come to regard it as an indication for the prompt use of stimulants.

The early occurrence of desquamation in this case—on the *fifth* day of the eruption—is also worthy of note, as indicating great pravity of system. In September, 1856, I met with a case in which desquamation began, all over the body, in extensive patches, on the *fourth* day of the eruption. The skin was as though it had been seethed or scalded; the cuticle separating first at the points of pressure from the motions of the patient, incident to her changes

of posture in the delirium—as the elbows, hips, &c.—but finally coming away wherever the clothing lay in contact with it. These denuded surfaces were literally raw; when recent, serum standing upon them in minute drops. The patient, a girl of 15 years, died rapidly of pericarditis.

Case III.—*Purpura following S. Anginosa and Maligna.—Feb.* 23, 1857. In this instance, as in a considerable number of others in this epidemic, I observed that the eruption on the arms was most fully out along the course of the nervous trunks, there being a broad belt, of an intensely red colour, in the line of the bloodvessels and lymphatics, from the hand to the axilla. Having never seen this symptom noticed, and having observed it only in the worst forms of the disease, I have been led to regard it as indicating either phlebitis, or inflammation of the absorbents, and, as such, a serious complication of the case. The details of this case are very similar to those previously given, and hence need not be gone over. It is sufficient to say that the child recovered with the greatest difficulty; but by the end of the first week of March he was clearly convalescent, although greatly reduced, and *very pale.* He, however, took nourishment, with acid mixtures, and it was hoped he would do well.

March 13. I was informed this morning that his mouth bled slightly, and that the blood appeared to ooze from the gums. Sent him tinct. chlorid. iron, and saw him in the afternoon. Found that epistaxis had set in; the blood looking pale red in colour, like a mixture of currant-juice and water. Purpura patches had appeared over the whole of the lower extremities. Prognosis very unfavourable. Beef-essence and elix. vitriol at short intervals, alternating with sol. potassio-tartr. iron.

14*th.* Getting worse rapidly. Purpura on arms and breast. In the course of the day, vomiting of coagulated blood, which had evidently passed into the stomach from posterior nares. Vomiting continued; everything was rejected; and in the afternoon, after having passed some bloody urine, the child died, perfectly blanched.

Remarks.—This case is interesting, as confirming, to some extent, Dr. Brown's views of the pathology of scarlatina. Here was, first, a deficiency of red globules in the blood, as was evident from its pale red colour. We infer, also, an increased tenuity in this fluid, as manifested by the hemorrhagic tendency, and which may have been caused either by a deficiency of fibrin, or a preponderance of serum, from paucity of red corpuscles. However we may explain the morbid result, the occurrence of purpura is almost inexplicable under the constant administration of the strongest nourishment and acid solution, unless we admit the coexistence of the scarlatina poison, acting upon the blood to bring it into this dissolved state. At least, this was not congestive or inflammatory purpura.

Would it not be advisable, in every case of s. anginosa and maligna, especially the latter, to administer, as soon as the disease has subsided, and desquamation is beginning, a mild preparation of iron? Might not the fatal termination in this case perhaps have been averted by the earlier employment of a ferruginous tonic? Further, would not also the iron, by increasing the crasis of the blood, lessen the chance of dropsy? Or, on the other hand, would the iron be capable of increasing the tendency to dropsy, by rendering

the blood inflammatory, and so favouring the renal disease, which is so prominent a symptom (if not the cause) of the dropsy? This is quite possible, regarding, as I do, the condition of kidney in the dropsy of scarlatina as a real, though temporary, acute Bright's disease.

Supposing, however, as does Dr. Brown, that the watery condition of the blood after scarlatina is the cause of the effusion, how can we reconcile with this the benefit derived from venesection in dropsy? If this supposition be correct, are we not, by the abstraction of blood, and the consequent still further impoverishment of that fluid, increasing the tendency to effusion? Instead of which, we find the swelling mostly soon to disappear rapidly after bloodletting. At least, such has been my experience, repeatedly, in bad cases of cerebral and cardiac dropsy; and Watson, in similar cases, gives bleeding his unqualified approval.

These facts militate strongly against the causation of dropsy, as explained by Dr. Brown. For the present, then, we know of no solution of the difficulties presented to us above, and must be content to follow apparently opposite indications, if correct and successful, without being able to reconcile differences.

Case IV.—*Scarlatina in Childbed. Scarlatina Neonati.*—On the 2d of July, 1856, I was requested to see the wife of Fred. Schäffer, in an attack of s. anginosa. She was at the end of her pregnancy, and expected her confinement daily. Both of her children had just passed through a severe attack of the disease, and she had been their only nurse. Knowing the disastrous consequences to be apprehended from scarlatina during confinement, I undertook the case with no little anxiety. On the 4th, the premonitory symptoms of labour appeared, which I treated with anodynes, hoping to put off the evil day as long as possible. Moreover, dreading the exhaustion which would be likely, in such a case, to follow the excitement of labour, and still more the debility consequent upon the lochia (which would act as a drain upon the system), I sought to prepare the patient for the crisis by moderate doses of carbonate of ammonia, serpentaria, and beef-essence. By a cautious use of opiates, the labour was kept off until the afternoon of the 6th, when the woman was delivered of a mature female child, which, however, lived only three or four hours. This child was covered from head to foot with the eruption, of an intensely red colour; and, lest I might have mistaken the naturally florid colour of many newly-born children for scarlatina, I examined the fauces, and was surprised to find prominent anginose symptoms, and the soft palate thickly studded with red points. The infant soon became cold, and the eruption changed to a purple hue, which, before death, gave place to an almost indigo colour.

My precautions in regard to the mother proved to be well-timed. In addition to the supporting plan adopted before confinement, she now bore well a generous supply of wine. She made a good recovery; but, a week afterwards, was attacked with subacute rheumatism of the wrists, which yielded to Dover's powders and vinum colchici.

Remarks.—Ramsbotham, in his work on Parturition, highly recommends a stimulating and supporting treatment of the scarlatina of puerperal women,

as the only method likely to prove successful; and the above case is interesting, as confirming not only his own views, but also those of Dr. Brown. Morris, in his *Lectures on Scarlet Fever*, says that "to pregnant and puerperal women it is almost inevitably fatal. I have known several cases which proved mortal, but have never heard of a recovery."

These cases, from my own observation, must suffice for my present purpose. They confirm, and correspond with, Dr. Brown's teachings and cases very fully; and this correspondence between two epidemics thus widely separated as to time and space is certainly more than a mere coincidence. It seems to indicate a certain general principle, which underlies, and so essentially determines the nature of this, as of every other affection, through all the variations of climate, locality, and prevailing type of disease. Whether this principle, which Dr. Brown professes to have discovered as regards scarlatina, be the correct one, can only be determined after extensive and frequently repeated experiments.

Finally, to all the evidence adduced by Dr. Brown in favour of the preservative effects of acetic acid upon the blood, it is proper to oppose the testimony of our best American authority, as to its injurious effects in large and long-continued doses. Dr. Wood, in his *Therapeutics*, says that, thus administered, besides producing gastric and intestinal irritation, "it lowers the organic functions of the system generally, impairing nutrition, depraving the blood, producing anæmia and emaciation, and ultimately, it is said, inducing a condition analogous to the scorbutic." The same writer refers to its liability to develop the tubercular diathesis, when taken habitually, as it sometimes is, with a view to obviate fatness. Whether, and to what extent, Dr. Brown's use of the article should be considered toxical, it would be difficult to say; but probably the diluted state in which it is given, and the comparatively short time that it is administered, will save it from being so regarded, except in so far as many of our best remedies are poisons, in over-doses.

Art. III.—*Cases of Partio-General Paralysis, or the Paralysis of the Insane.*

By Pliny Earle, M. D.

In previous issues of the *American Journal of the Medical Sciences*, I published two series of cases of that peculiar disease termed, by the French physicians, *Paralysie générale*, and by the English and the Americans, *paralysis of the insane*, but for which I ventured to suggest the name, *partio-general paralysis*.

Those cases included all the distinctive characteristics of the disease, and the number of autopsies was sufficient to furnish a pretty clear idea of its

cerebral pathology. Most of the cases, a report of which it is proposed to include in this article, present peculiarities, or exceptional characteristics, which render them worthy of preservation. In the one first presented, the disease ran its course so rapidly that the patient was exhausted before the extreme symptoms of paralysis had appeared.

Case I.—Mr. ——— was born in the interior of the State of New York. He was of medium stature; his hair was light-brown, his eyes blue, and his temperament bilious-nervous.

He learned the business of printing, and worked at it for some years. His intellect was above mediocrity, and his acquirements became such, that at length, and during a term of several years, he was an assistant editor of a newspaper in the city of New York.

In business, he was industrious and persevering; in habits, generally esteemed correct, although, from early life, it is supposed that he gave a pretty free rein to the venereal propensity. He also drank wine, but perhaps never to intoxication. He was married, and had several children. It is said that his parents were both "eccentric," if not insane.

In the summer of 1847, it was observed that he had become unnaturally irritable. This disposition increased upon him through the ensuing autumn and winter, and, in the spring, there were some evident symptoms of insanity. He, however, continued in his business until about the 1st of May, when the disease prevented the further performance of his duties. On the 10th of May, at the age of forty-two years, he was brought to the Bloomingdale Asylum.

Condition on admission.—He is restless, excited, and incessantly talking, if any one be present. Countenance animated; pupils contracted, unequal —that of the right eye the smallest; tongue moist, pallid, smooth, and very slightly coated; pulse considerably accelerated. No abnormal sound of the heart.

May 11*th.* He occupies one of the best rooms, and, if alone, is quiet. He says the Common Council will give this Asylum to him. He will have four hundred mechanics here, and will raise vegetables enough to supply the city. He will want two or three clerks, and three secretaries. He will give ten thousand dollars to stay three weeks and carry out his plans; or he will buy the place in less than a week, pay one hundred and fifty thousand dollars for it, which will not be more than a cent to him, will have all luxuries, and supply all the other patients with them, and will cure all the patients by a special course of treatment.

He has a very slight impediment in his speech. In the midst of conversation, he stops to whistle or to sing.

13*th.* He says he is the cream of American patriotism, and that God has revealed to him all the events of the last six weeks. He is restless, loquacious, petulant; sheds tears, and asks if Washington is not here.

14*th.* He mentions the names of several attendants and patients, claims them as his illegitimate brothers, and offers each of them "a carriage, horses, and twenty thousand dollars, to start upon." Says that he shall be the next President of the United States, and that the Supreme came down last night, and rested on the window-sash, and is still in that cloud (pointing upwards through the window), ready to come down at his bidding.

15*th.* He asserted that he is the "Duke of Gloucester, and entitled to the throne of England, of which Victoria is not the legal possessor." A few

minutes afterwards, he said he was President of the United States and King of England; that his legs are iron, and that he wound up the sun yesterday.

16*th.* He calls one of his fellow-patients the Pope, and to several others gives the titles of some of the English nobility.

20*th.* His excitement has gradually increased from the time of admission. Having become very boisterous, by both day and night, and having begun to destroy furniture and clothing, he was now removed to the ward for violent patients.

21*st.* He declares that he is the son of the King of the world; that he was in the Crusades; that the writings of Shakspeare and Scott are merely a record of his life; and that he had a conversation with the Black Prince night before last.

22*d.* Says he killed Abel, in the garden; that Eve was his mother; that all the people in the world are descended from him; and that the Dutch Queen had such an affection for him that it made a tumour grow on his right side. He is much excited, very noisy at night, and destroys clothing.

23*d.* On entering his room, I said: "You are noisy!" "I've a right to be," he answered. "I'm the god of thunder!" His tongue, as usual, is covered with a thin, white, strongly adherent, pasty fur; bowels habitually costive; right pupil smallest—both contracted; pulse 96, regular; sounds of heart normal; general sensation obtuse. He has emaciated constantly since admission.

26*th.* He tore his bed to tatters "to find his cattle;" says he can jump over the house, but is so large he cannot go through the door; tells the physician that he can hold him on his little finger, and could sustain the weight of the world if he had a foothold.

Neither his mental nor physical symptoms changed during the early part of June. On the 19th, his scalp, forehead, and right arm, were much tumefied and ecchymosed, as if beaten against the wall. Being asked how it was done, he laughed, and said: "Jesus Christ did it." Towards the end of the month, and in the early part of July, he became more emaciated and feeble; his excitement was less constant, but occasionally, even in the latter part of July, he was very turbulent. At the close of the month he was nearly exhausted, all the worst symptoms, both mental and physical, above mentioned, continuing. Almost the last words he uttered were an assertion that he was one of the men mentioned in the Old Testament. Died, August 2d, 1848.

Treatment.—Purgatives, alteratives, and tonics. A seton was inserted in the back of the neck on the 23d of May, and continued until his death. The discharge from it was never copious. Regardless of all medication, the disease regularly proceeded towards its fatal termination.

Autopsy, sixteen hours after death.—Pericranium pretty strongly attached to the skull, and but little blood in the vessels. Cranium adheres more than normally strong to the dura mater. It is of ordinary thickness, and not unusually hard. The dura mater adheres to the subjacent membranes on the anterior lobes, and for three inches over the vertex, on the border of each hemisphere, beside the longitudinal sinus. The latter attachments can be separated by dissection alone. The whole brain, when removed from its cavity, appears unnaturally soft or flaccid, and its weight, when laid upon its base, partially tears asunder the corpus callosum. The arachnoid is thickened, semi-opaque, and strongly adherent to the pia mater upon the whole surface of the cerebrum, except the base, where it is normal. The pia mater adheres so strongly to the cortical substance, that, on removal, it brings off small patches of it. Bloodvessels not remarkably injected. The cortical

matter is of normal colour, but is decidedly softened. The brain being cut, the surface of the medulla is interspersed with some bloody points, but they are not numerous. The corpora striata, and the medullary matter around them, are thought to be somewhat softened—the most so in the right hemisphere. The fornix is very soft. The pineal gland contains very little sabulous matter. There are filamentous adhesions between proximate surfaces in the fourth ventricle, and at the base of the brain. One ounce of serum in the ventricles and at the base. Cerebellum thought to be somewhat softened. Its investing arachnoid apparently normal.

Considering the protracted course of the next case, and the comparatively extreme degree of the paralysis of the voluntary muscles, it is remarkable that the functions of the digestive organs were so little impaired, and that the patient was exempted from those sloughing ulcerations which are one of the most striking characteristics of the disease in its severer forms.

Case II.—Mr. —— was a native of the State of New York. He was tall in stature, his hair black, eyes blue, temperament sanguine-bilious, the bilious greatly predominating, constitution *mediocre*. His intellectual faculties were fair, and he received a good English education. Being devoted to mercantile pursuits, he emigrated to a southern State, at the age of between 25 and 30 years, established himself in business and was sufficiently successful. He was never married. It was said that his habits were correct, but by persons who had no intimate knowledge of his course of life. His mother was eccentric, but it was asserted that he inherited no predisposition to mental disorder. At the age of 35 years he had scarlatina; and at the age of 43, what is described as a "slight attack" of paralysis. He lost his property and became excited with political affairs, but whether prior or subsequently to the commencement of insanity, could not be accurately ascertained.

Having become insane, he was brought by sea to New York. On board the vessel he was so violent that he was most of the time kept in a strait-jacket.

On the 18th of March, 1848, at the age of 45 years, he was taken, as a patient, to the Bloomingdale Asylum. He was then emaciated, his skin sallow; the tongue furred and pasty; bowels costive; pupils unequal, the left being the larger; speech imperfect and hesitating; gait faltering. He appeared bewildered, thought he was in Savannah; said he saw an angel on the previous night; would begin to speak, and, forgetting the idea, run to another subject.

He slept but little, at night, during the first few weeks after admission; but he could not bear opiates. One morning his forehead was severely bruised, probably, as has occurred in other cases of the kind, by running against the walls. On being asked how it was done, he said, "The raft slid into the river and many people were killed, but the ladies walked across the plank of the steamboat and were saved." On the 14th of April he said that he was in a southern city, and that on the previous night they "stuck him into a rotunda to sleep." A copy of a New York newspaper being handed to him, he appeared much astonished and remarked that "it must have come by telegraph." General sensation was then very obtuse. On the 16th, he said that in the night he saw five or six hundred little soldiers, beautifully dressed, and on horseback; they were not larger than his forefinger, but they "fought the Bostonians courageously, like tigers." His bed being wet and emitting a strong odour of urine, he was asked the cause of it, and answered

that some person opened his window, and a shower coming up, it rained upon him—but it was warm rain. The night was clear. On the 20th, his appetite was good, and he was gaining flesh and improving in general health. He said he had some barrels of the best wine in the world; and, assuming a very earnest, business-like manner, requested to be let out into Broadway, as he was going to the banks and was afraid he should be too late.

In the summer he took Lugol's solution of iodine; and a seton, which was introduced on the 4th of April, caused a free discharge. He gained flesh, and his general health was good. His mental condition varied, but was at no time much, if any, better than at the time of his admission. He had but little memory of recent events. Soon after a visit from his mother, he said it was more than a year since he had seen her. In the early part of August it was perceived that he had lost the sense of taste. He ate all kinds of food with equal relish. In the early part of September, his feet were œdematous for a few days.

On the 17th of November his pulse was 76, regular; pupils unequal, the left being the larger; appetite voracious; face and feet œdematous; gait unstable. He walked with his feet far apart, like an infant; the grip of the hand and the strength of the arm were feeble; speech considerably impeded, but less so than at some former times. At this time, he occasionally tore his bedclothes and upset the furniture in the room. On the night of the 29th of November, he thought the earth was sinking, and, in order to save himself, he turned his bedstead up, upon the side, and seated himself astride it. He said he was thus enabled, by using his utmost exertions, to save himself from being engulfed. His speech was now much more impaired than at any previous time. General sensation was nearly null, but existed to a greater extent upon the legs than upon the superior portions of the body. His feet and hands were somewhat œdematous. He asserted that he could run twenty-five miles in an hour, or walk twenty miles, and that he owned six hundred acres of land at the South and one hundred acres in Harlem, occupying the latter as a barber's shop. Being requested to write a letter to his mother, he sat down, and, after much labour, hesitation, and alteration of orthography, produced a document, of which the following is a copy:—

"Mrs. Deear Motherr
Vder as —— this 29th Jurly
b — o gond to
$18. S. DOOCCKET."

The signature bears no resemblance to the name of the patient, except that the initial letters of the former are the first two of the three which belong to the latter.

There was no material change in his general condition at the time I left the asylum, in May, 1849. Neither was there, as I am informed by my successor, Dr. Nichols, throughout that year. During the whole of his residence in the asylum he never recognized, as an acquaintance, any person except his mother. During the last six months of his life he did not know even her. In the early part of 1850, the power of the voluntary muscles visibly diminished, but most rapidly in the lower extremities. For six months before his death he could not walk without aid. His digestive functions remained but slightly impaired until the 5th of August, 1850, when he was attacked with diarrhœa and died on the following day. No autopsy.

The third case is exceptional, so far as my observation is concerned, in the striking similarity of its earlier symptoms to those of *mania-à-potû*. The

disease was rapid in its course, and all its other characteristics would probably have soon assumed their worst form had not the patient been carried off in an attack of cerebral congestion.

Case III.—C. —— was a native of Ireland. His constitution was strong, frame robust, stature medium, hair sandy, eyes gray, temperament sanguine, intellect *mediocre*, education common. At the age of about 22 he emigrated to America, settled in the city of New York, and established himself as a retailer of liquors. He was subsequently married. He afterwards became addicted to the daily use of alcoholic drinks, though not frequently to intoxication.

In September, 1846, when he was at the age of 28 years, he lost a favourite child, and his friends say that his insanity appeared immediately afterwards. He was subjected to no medical treatment. For four weeks he gradually grew worse: was restless and talkative, and indulged in extravagant schemes of business, made imprudent purchases, and wandered about the city, apparently without any definite object. At length, having determined to go to Ireland, he went to a wharf, jumped into a boat, and rowed himself out into the river. His determination then changing, he leaped into the water and swam to the shore.

A day or two after this occurrence, and on the 16th of October, he was brought to the Bloomingdale Asylum. His friends asserted that he inherited no predisposition to mental disorder, and had always enjoyed good bodily health.

During the first three days after his admission, he had all the symptoms of a person labouring under a severe attack of delirium tremens.

He was excited, sleepless, turbulent; had hallucinations of vision, and would keep no clothing upon himself, excepting a blanket thrown over his head, or wrapped about his body. His tongue was tremulous, his pulse rapid.

After catharsis with cal. et jal. followed by compound cathartic pills, he took mass. ex hydrarg. gr. ij. t. d. and, subsequently, a portion of pulvis purgans. On the 23d, he was so much improved that he was permitted to be in the hall and to go out of doors; and, on the 24th, he began to take a tonic vegetable infusion. He rapidly gained strength, and on the 29th the medicine was stopped. During this period there was a partial bewilderment in his aspect and manner. He was careless of his personal appearance, at times tore his clothing, and was otherwise mischievous. His appetite was now good. He generally ate voraciously, and required occasional purgatives. This was the only medical treatment to which he was subjected, with the exception that, a few days before his discharge, he took Fowler's solution gtt. v. t. d.

November 10. For several days past he has uttered the most extravagant ideas. He now says he owns the asylum premises, and is worth two hundred thousand billions of dollars. He also declares that he is the head of the church throughout the world, and is going to turn the earth into a paradise, and manage it all himself.

11*th*. He went to the school-room and wrote a letter to his wife, from which the following extracts are made:—

"I am at the reading school and am one hundred times as smat as any of them they they are the greatest dunces in Eternity I shall commence travelling next week Please God and the first place I will go to is to my native own green Isle" * * * "I would not trust the word no but the Oath of G. and O. I wd not

Trust them in an Empty room or a room full of Mill stones I am tak as many friends as go with me By their Paying Expences it wud not not mak much of a difference I shl have High life all over the continet and all the Corners in the World which I will make a Parridise of all the world and Have shepherds to take care of them so that has Plenty

Resp ful
C. —— ——
Head of the C. Church
all over the world
C. —— ——"

12*th.* The pupils are unequal, the right being the larger. There is an evident stammering in his speech, and general sensation is so obtuse that he can barely feel the most severe pinch.

He says he is worth ten times as much as John Jacob Astor. Being seen to make some strange gesticulations, he was asked what he was doing, and answered that he was blowing himself up; that he could blow himself so large that he would be thirty feet in height, or reduce himself to the size of twopence. On being requested to blow himself up, he put the end of the forefinger of each hand into the ear of the corresponding side, elevated his head, rolled his eyeballs as far upwards as possible, compressed his mouth, puffed up his cheeks with air, stretched himself upwards, standing upon tiptoe, and thus exerted himself until his body was in a general tremor. Upon being told that that was enough, he said, "Oh, that is nothing; I only went up to nine feet."

16*th.* He is endeavouring, with but little success, to sing; says he hears and sees music throughout his body, and can sing better than any man at the Italian opera. He asked for writing materials, for the purpose of "corresponding with all the different governments on the subject of converting the world into a paradise." Being permitted in the afternoon to go to the school, he wrote a long letter to his wife. It was so badly written as to be almost illegible, and closed with a postscript consisting of two verses of pretended poetry, but, so far as it could be deciphered, contained no rhyme and but little reason. From this time his delusions continued unchanged.

23*d.* Sphincter of the bladder apparently paralyzed. He says he can swell to the height of more than a hundred feet. He is very noisy at night; chews and swallows pieces of woollen rags, picks his clothes to pieces in the daytime, and empties the straw from his bed at night.

25*th.* He shuts his eyes, and says he sees "gold and all the brilliants in their shape and lustre manufactured;" says he weighs five hundred pounds, can run thirty miles in an hour, and walk twenty. He frequently "blows himself up;" attempts to sing, talks of his wealth and of his proposed conversion of the world into a paradise. He exhibits little or no interest in his relatives and friends.

On the 26th he fell into a state of coma, with very slight spasms of the limbs of the right side. This resisted the usual remedies for more than twelve hours, when he partially revived. He continued in bed, rarely speaking, and with but imperfect use of the right arm and leg, until the 29th, when he was removed from the asylum, and died at home on the following day.

No autopsy.

The subjoined is the most remarkable case of the kind that has ever fallen under my observation. It is the only case of recovery from the partio-general paralysis that I have ever known, and the second of which I have ever heard

as occurring in this country. Mr. Calmeil, who first minutely described the disease, and who had for more than twenty years been connected with the hospital for the insane at Charenton, near Paris, where hundreds, perhaps thousands, of cases had been treated by him, informed me, in 1849, that he had never known a case of complete recovery. He had had patients who improved sufficiently to return to their homes, and, in some instances, to pursue their occupations, but in every one of them the disease had resumed its course.

Case IV.—Mr. —— was a native and resident of one of the interior counties of the State of New York. He was of medium stature, with brown hair, gray eyes, and lymphatico-nervo-sanguine temperament. His constitution was strong; his intellect above mediocrity. After pursuing a classical course of study, he read and practised law, and became eminent in his profession. He was married at the age of 34 years. Although not intemperate, according to the common acceptation of the term, yet it was said that he "liked good living, and indulged freely in the luxuries of the table." One of his paternal uncles was insane, and a maternal aunt was affected with melancholia.

In August, 1847, he was much afflicted by the death of a favourite child; and in September, having involved himself in pecuniary difficulties, he became melancholy. In the early part of 1848 he had an epileptiform fit, which was followed by another upon the same day, and, subsequently, by several others. It was said, however, by his friends, that previously to this his speech had become defective, and the muscles of his arms so much impaired in their action that he was unable to write. His disease continued gradually but slowly to progress, and for some time he was under the care of the local physicians. On the 30th of July, 1848, at the age of 42 years, he was received into the Bloomingdale Asylum.

At the time of admission he was much excited, constantly in motion, walking to and fro, talking incessantly and incoherently, mostly upon pecuniary matters. He wanted to go to Wall Street, where he said he would purchase $35,000 worth of railroad stock, and make a great speculation. He spoke rapidly, but frequently dropped a syllable, and sometimes hesitated, from inability to utter a word. The pupils were contracted, but of equal size; tongue furred; pulse somewhat accelerated. After the administration of a dose of *pulvis purgans*, he was put upon the use of twenty drops of antimonial wine, with ten drops of the tincture of digitalis, three times daily.

31*st*. He is still much excited, shouting that he wishes to get out of the house and go to Wall Street. His speech is more imperfect than it was yesterday. No evacuation of the bowels. ℞.—Cal. et jal. āā grs. x.

August 1. There having been but a slight alvine movement, another portion of pulvis purgans was administered. This produced free catharsis, and his excitement was considerably subdued.

6*th*. The pupil of his left eye is larger than that of the right, and there is an evident partial paralysis of all his limbs.

11*th*. His excitement has almost entirely subsided, and the paralysis has so far increased that he cannot walk without support. Stop the vin. ant. and tinct. digital., and give a tonic vegetable infusion three times daily.

14*th*. His ideas of wealth, of station, and of power have been constantly increasing since his admission. He now says that he began business with a borrowed capital of three hundred dollars, and from that has accumulated a fortune of five millions; that in the town of Oswego he has one hundred and

fifty mills, each containing five runs of stone, and the whole turning out twenty-five thousand barrels of flour each week; that a million of dollars has been cleared by this operation; that he has seven ships at sea, four of them on whaling voyages, two bound to China for cargoes of tea, and one to the Mediterranean for fruit; that he has purchased the whole of the United States, except New York and Philadelphia, together with the wheat lands in Canada, and the whole of Mexico, for all of which he paid but one million of dollars; that he owns two coal-mines, one in Virginia and the other in Mexico, all the copper-mines in Wisconsin, one gold-mine in Africa, all of those in Mexico, as well as all other mines of gold and of iron, and that his income from each of these mines is seventy thousand dollars in three weeks; that among the rest of his property are—1, the Bank of Milwaukee, with a capital of three hundred thousand dollars; 2, three hundred thousand dollars invested at twelve per cent. interest in New York; 3, stock to the value of five and a half millions in the Hudson River Railroad; and 4, a factory in one of the towns upon the Hudson River; and that he is about to establish a bank in New York, with a capital of two millions of dollars.

He asserts that he is a Judge of the Supreme Court of the State of New York, and a member elect of the next Congress; that he is to be appointed minister to England; and that he shall be elected as the next Governor of the State, and the next President of the United States after General Taylor. He proposes to start, to-morrow, on a tour to the Catskill Mountain House, the Thousand Islands, Quebec, Montreal, Oswego, Falls of Niagara, Ohio, Washington, Florida, Mexico, and Buenos Ayres, returning by the way of Mexico, Mississippi, Illinois, and Oregon. This journey, he thinks, will occupy his time for four weeks. He intends, after it is completed, to start for Europe, and spend two years in England, two in France, one in Switzerland, one in Germany, one in Sweden, three in Russia, one in Norway, one in Turkey—in Constantinople—("Con-con-stan-no-nople," as his impaired enunciation makes it) and one week in Africa, making, in all, eighteen years. He proposes to take his wife and children to Russia with him, in a steamer of one thousand tons burthen, which he will have built expressly for the purpose and named for himself and wife. He will freight it homeward with English goods which will yield a profit of $100,000. On its second voyage, he intends to return and to build twenty houses, at a cost of $10,000, each, on one of the docks in New York.

17*th.* His general sensation is obtuse; his taste imperfect. A portion of the sulphate of magnesia being prescribed for him, it was made into a strong solution which he drank, saying that it was "first-rate Congress water."

21*st.* The paralysis has extended to the sphincters of the bladder and rectum. The patient's speech is variable, being much more imperfect upon some days than upon others. His memory of recent events is almost entirely destroyed. He says that he has invited several guests, among whom are God and Van Buren, to dinner; and that one of his whaling vessels arrived yesterday with twelve hundred barrels of oil, upon which he will make a nett profit of fifty thousands of dollars. On being informed of the recent destructive fire in Albany, he remarked that he did not "own any of the buildings which were burned, except the Eagle Hotel, the Mansion House, the Townsend House, and the Odeon, which are all insured for their full value." He added that he has "bought all the land of the burned district, and is going to build it up with marble;" and that he will "immediately give one hundred dollars to the sufferers, and fifty thousand dollars by and by."

There are many sores upon different parts of his body, some of them appa-

rently having arisen without any external cause, and others the ulceration of places upon which the skin was abraded in the course of his period of high excitement. Attempting to write his name, his hand is unsteady, moving by partial jerks; and although one or two of the letters are pretty accurately made, others are very imperfect, several are entirely omitted, and there are some unmeaning marks. It takes him probably five times as long to write it as it did prior to this disease. On the second attempt he is somewhat more successful, but his writing is no better than that of a child in his first essay upon a connected fine-hand copy.

September 1. The left pupil is larger than the right; but both are contracted.

3*d.* He says he is worth ten millions of dollars; that the Lord came down to him; that he is now sixty-five years old, but the Lord will make him only twenty-five.

5*th.* Besides his fanciful ideas of wealth, he now has many religious delusions. He often calls himself a bishop, or a clergyman, and asserts that he is going to preach in Trinity Church.

17*th.* He says that God is up in the room, on his throne, and is going to preach to-day; asks us to go up and see him. A seton was, this day, inserted in the back of the neck.

18*th.* He talked as follows: "I went up to God, one day, and said, 'God, what is the reason that —— and —— are in hell?' His answer was, 'They are not in the right line of succession with the church.' 'Well,' says I, 'what does the devil do with them when they are first put in there?' He said they were first ground down with fire and red hot iron; afterwards they were ground down with spirits of turpentine and saltpetre. Don't you think that will make them smart?" He then proceeded to give an account of his wealth, and concluded by saying that he was the most eloquent lawyer in the world.

27*th.* His pulse is always rapid. It is now 124 per minute, small and regular; pupils nearly equal, tongue slightly coated, bowels regular, the sphincters under voluntary control, general sensation less obtuse than it has been. He writes better than he did, and can stand alone, but cannot walk without assistance. Being asked how much he was worth, he answered "Nine hundred thousand dollars," hesitated a moment, and then added, "No; God says it is ten millions. I have made ten thousand four hundred dollars while you have been sitting there; and I own a million dollars' worth of jewels." He then said that he goes up to Heaven, to see his father, and offered to take his mother up with him.

The seton produced a considerable discharge throughout the month. The tonic infusion was stopped in the early part of October, and followed, through a large part of the month, by alterative doses of the bichloride of mercury. Under this treatment the discharge from the seton almost entirely ceased, most of the sores upon the body healed, and the appetite and digestion of the patient continued to be pretty good. In the latter part of the month he was attacked with diarrhœa which was subdued by opiates. All the characteristic symptoms of the paralytic insanity varied from day to day, but, subsequently to the 27th of September, the patient was not at any time better than upon that day. The general character of his delusions remained unchanged. At one time he enumerated the different offices of which he imagined himself to be the acting incumbent. Among them were the presidencies of several banks, insurance offices, and railroads; a number of bishoprics;

offices under the national government, &c. &c. He made the aggregate salaries $76,000 per annum.

On the 3d of November, 1848, the patient was removed from the Bloomingdale Asylum to Dr. Macdonald's private institution, at Flushing. There, after a residence of some time he began to amend, and at the end of a few months was discharged, recovered. Dr. Macdonald died soon afterwards, and I had no opportunity of conversing with him in regard to this very remarkable case. I am informed, however, by Dr. Benjamin Ogden, that no special treatment was pursued which was supposed to have effected a cure, but that Dr. M. attributed the patient's recovery solely to an effort of Nature.

This gentleman is still living. He is in excellent health, both physical and mental, and is engaged in an extensive and successful business.

In the following case, the symptoms, not only in its earlier periods, but along its course, were such as to lead the experienced observer to the prognosis of paralysis; and yet, although the progress of the disease was comparatively slow, and although some of the other most peculiar characteristics of the partio-general paralysis were present, the paralysis itself never appeared.

Case V.—Mr. ——, a native of the interior of New York, was of medium stature. He had brown hair, gray eyes, and bilious-nervous temperament, the nervous greatly predominating. His talents were fair, and he received a good common education. He was active, intelligent, and of mild disposition, though excitable. His mother once had an attack of insanity. He entered into business, and when quite young accumulated great wealth by speculating in real estate during the years 1835 and 1836. This fortune, however, he subsequently lost; and afterwards engaged in various kinds of business. He was married and had children. In the winter of 1845–46 he came to the city of New York, in the hope of finding employment. Soon after his arrival his friends perceived that he was eccentric, wilful, and easily excited; more than usually talkative; self-complacent when speaking of his business capacity, and elated with great hopes for the future. These symptoms increased. He began to make imprudent purchases; gave away his money, lost sleep, and grew more and more excited until the 23d of February, 1846, when, at the age of 36 years, he was brought to the Bloomingdale Asylum. His friends stated that he had had a cough ever since the preceding summer.

State when admitted.—Emaciated, somewhat sallow; pupils natural, tongue slightly furred, bowels costive, pulse 110. He is restless, and very talkative, but shows no disposition to be violent. He consents to remain, but thinks that "placing a man, so well as he is, in a Lunatic Asylum, is one of the most ridiculous farces ever imagined." His general conversation is quite rational, and no attempt is made to elicit his exalted ideas. Before his friends leave, however, he in great good humour takes some papers from his hat and requests the Dr. to look at some poetry which he has this day been writing. The paper contains six stanzas, the first three of which he says were written by his favourite author, Mr. Tupper. The others are a parody upon them composed by himself. After reading these lines, and hearing a history of his case, I told his friends that I thought there was but little hope of his recovery.

February 24. ℞.—Blue mass gr. ij t. d., with an aloetic pill morning and evening.

March 1. Skin more natural and he looks less worn; tongue clean, appetite and digestion good. Stop mass and pill. R.—Tinct. opii gtt. x t. d.

4th. Bears the opiate well; sleeps sufficiently. Increase tinct. opii.

Four days after admission he wrote a letter in reference to some mineral lands to a gentleman in the northern part of the State, with whom he was entirely unacquainted, requesting him to take men and teams to those lands, procure one or two thousand barrels or boxes of all kinds of minerals and send them to him in New York; stating furthermore, that if the said gentleman had not money enough to accomplish this object, he might draw upon him. He then proceeds, by way of introducing himself to the stranger to whom this letter is directed, to give a genealogical history of himself, and of his wife. He says that if the minerals should prove to be rich and the lands valuable, the county in which they are situated will become more populous. "We will," says he, "put a bank at your place or in Peru, and it would be a good place for a college for the north of this State, better calculated than any in the State now; for it might be used for the poor of the State, as well as those who could handsomely pay. I speak of this as an inclination, and not anything which would trouble me at all if it should not be worth anything. And as to the sum to be paid to the noble man, the owner of the farm, the soldier of the great Revolution—why, I think I would not feel a sigh to pay him $200 a year as long as he lives, without any interest at all, if it would do him good, for I feel perfectly well off, and it would give me much pleasure and contentment to do such a thing."

About the time of the date of the foregoing communication, after reading the advertisements of several valuable houses that were to let in the city of New York, he wrote to the owners, advising them to furnish the houses, as they would then rent more profitably than if unfurnished, and made some preliminary propositions in regard to hiring them. He subsequently wrote the following letter:—

NEW YORK, *March* 20, 1846.

"TO THE HON. DANIEL WEBSTER—

SIR: As a stranger, and having some business to have done at Washington, which I know to be of great importance to me, if not to our country. * * * For three years I have known what I now write, yet have said nothing; but now, as the great and good men of both parties, conservatives, are all together, I thought it of great importance; and it is this: That by using the bright sands of the sea-coast, and the small, round, clean stones, or other hard matters, with water-lime, you can make a road from here to the upper part of Oregon, in a month, or less; because water-lime, mixed with clean stone or glass, or anything solid, will make a road much better than a railroad. So far in a month, for instance, make it soft, and mix it clean, and throw it upon the ground as far as you choose, and make it smooth, and, as soon as it is dry, it is, in my opinion, harder than rock. And should the great men of our great democratic nation, now altogether to do right, believe surely, as I do, that, in one day, I could, with that mixture, by the aid of good builders, make one hundred ships a day. And now, suppose a ship was planned large enough to carry thousands. Make it three feet thick and one hundred feet wide, and flat on the bottom, having large places all along its side or bottom, to take it up if necessary, and put down again. Well, it would require no ballast; and round the sides, from the bottom to the top, and, while it is soft, at the bottom fix a keel, as low as profitable, that can at any time be hauled up for other purposes; such a ship, in my opinion, would draw but little. And, as far as war was concerned, no common shot or ball could hurt any one; for it is a rock, smooth, and the balls would slide under. Now, build as many as you please, in a month, and put them together, and in two or three days they could reach England, and everything upon the ocean could be taken without trouble, or anything else.

The reason they would, in my opinion, go so fast, is that they could draw no water, laying so flat, with a deep tiller, if it would be thought right, and with engines of the screw to give them their power; when they were wanted for something else, it would be well to have the engine screw put in the bottom, so that you could bring it within the ship, and have rollers under, which would cross any land one hundred feet wide; and make a railroad or road of hard rock, and as fast as the stuff could be thrown out (I mean the sand-lime and stone), the engine within would roll the rollers under the ship, and make the road smooth and ready for use as soon as it was dry. And, before it was dry, the same material would make a fence as high as would be necessary for anything, by sticking them down when wet. Carriages, and everything, almost, could be made, and will be, and buildings (safe from all fire) which now cost so much, could be built by my patent for a little. Now, in my opinion, should it be thought right, and above all question, in my opinion, England could be made a State of this Union, and all Europe, and this hemisphere, and the whole world, could easily be made one democratic kingdom. And now it is useless for me to say more at present. I have wished to be secured in the Patent Office for this matter for all time. All I have acted upon was a trial in digging a hole for a post, and putting it in, and throwing in this material, and it became stone. If such an arrangement could be made with our great men, say H. C., C., the Secretary of State, Mr. A., and the best in Washington, why, I think, without spilling any blood, an arrangement might be made with England, letting them have their titles they now have, and making them and their great men only as farces, our own great men to rule the world. I believe it was Napoleon who said, before thirty years, that Europe would be democratic or Russian. Now, I have been reading the great argument of Senator C. upon our position with Great Britain—wonderfully correct, and, with one exception, true. But he thinks to possess Mexico. It would cost millions. Why, it is all wrong, for it would cost nothing to speak about. If it would be allowed by our Union for a man to undertake the control of Mexico on his own account, I am sure it could be done in a month, and could be done without asking a cent from the country. I would begin a road with my mixture at Washington, *via* New Orleans, and, at the same time, make arrangements with the wire telegraph to use it under ground instead of above, for the use of the Government. There would be no hindrance from water or land in running such a road through to Mexico, with such a fence that few could get over on each side of it, and no guns could hurt or shatter the machine or ships. No blood would be spilt, but all taken.

"Now, not to let it be known that ships and other things are made in this way, it would be extremely necessary that the patent should be concealed, and the ships covered with sheet iron, and call them iron ships. And as to Canada and New Brunswick, it would be all the same, and I truly believe, if the question was placed by the great men of this country at England, with our ships in sight, that they would be satisfied to become part of our Government, and in doing this without much trouble. It would insure unto the United States the government of the whole world, making it democratic, or allowing the great men of their country to join with ours in the government; and it would be a wonderful affair in respect to the religion of our Maker, for now the news of the arrival from Europe is, that England is now in war at the East, and many thousands have been killed lately; and now is the time to put a stop to this business. If I am right in my idea of the great and wonderful power our Maker has given to this country, no argument, in my opinion, can be made which can be a conviction of truth against this: that the United States should do her most to gain the control of all they can, simply for the defence of their own liberty, and the liberty of the whole world.

"I shall say no more at present, but, at all events, as soon as you get this patented for me, and if you think I am wrong in my ideas of *right*, why keep this a secret, and return it to me. I would have no man see it, if your opinion is against it, as far as the Government is concerned.

Yours, respectfully, —— —— ——."

"P. S.—Show this to Calhoun, and let me hear from you immediately."

He wrote several letters to his wife. The following extracts are made from one of them:—

"My happiest moment in life is now, I am well beyond all question, and healthyer than I ever was before.

"I am so well that I have grown so strong and healthy that you would hardly know me. I was measured yesterday and found myself at least 6 feet high with boots on, my whole body looks as straight as it could be, and I cannot alter it. I feel great in my power which has been given to me by my Maker, for there is nothing I can not do in business and the following year will test the question." * * * "I can write any thing, poetry, argument, and can sing as well as I wish, and sing without knowing any thing, but with my ear, when I get through this I will give you a happy song, of three or four verses which I think will be suitable to the occasion. I have written to W—— upon country matters." * * * "I can follow Tupper and I think I can do what he has done." * * *

"And now to thro' off all nonsense I will write a few verses as I said I would

"Dear blessed sweet —— a dear Queen
Always so beautiful, as the sun shining
Upon the Earth which our Maker, green
Has given to you and to me, rising.
Upon this wonderful world beautifully seen
With our eyes beautifully shining, devising
Our word of the great truth, upon which we lean
Given by the Lamb of our Maker so, rising
Above the great world, by our Redeemers will,
That you and me, with holy thoughts, sighing
Away our delightful selves, so still
To our Redeemers; wonderful rising
From death, to his everlasting good
Which wakes you dearest, and your loving ——.
In this beautiful world our hearts always good,
To Our Redeemer, which always will make us
Nature Nobleman, and queen with our
Dear blessed hearts in one hand, in one hand."

May 29. He has gained much flesh, his appetite, digestion, and general health are very good, and there appears to be no indication for further medical treatment.

From the time of his admission his restlessness and excitement have gradually subsided. He is perfectly calm; and a stranger, in a short conversation with him, might not perceive anything peculiar. To those around him, however, he frequently enlarges upon his magnificent schemes. He imagines that he has more talent and skill in everything than any other man. In literature, particularly, he believes no one to be his equal. He really plays skilfully at cards and nine-pins, but is irritated at the least opposition.

After this he continued very slowly to improve, although he was subjected to no further medical treatment. He had the liberty of the premises, upon parole, and passed much of his time, during the summer, sitting or lying in the shade, reading. He less and less frequently alluded to his extravagant notions, and throughout most of the winter could not be induced either to speak or write anything in reference to them. It was believed, however, that he still secretly entertained some of them; and a degree of his self-complacency was still exhibited. In the course of the winter he did considerable writing for the officers of the institution, copying documents in a good, legible, and firm hand.

Discharged, much improved, January 2, 1847. He went to his home. About two months afterwards he called at the asylum, and appeared to be in nearly the same condition as when he was discharged. He now attempted to

obtain employment in the city, but his friends were obliged to send him again to the country, as he was considered unfit for business. On the 20th of May, 1847, he was taken, handcuffed, to the Utica Asylum. For a time he was excited and somewhat destructive. His ideas were exalted, and in the daytime he was almost constantly in motion. He said he was going to be President of the United States; that he owned the State of New York, and was going to plough it all with a plough made of cement. He pretended to communicate with his wife, and with the government, by telegraphic despatches. He thought his food was poisoned, and at length refused to eat, so that it became necessary to feed him. There was no evident defect in his speech or gait. In the autumn he became more calm, and joined others in playing cards; but even in his best condition, if he was alone, he was constantly walking to and fro, rubbing his hands, and pretending to be making worlds.

After a few weeks he became more excited, and it was necessary to confine him in a darkened room, and, at length, to his bed. Here, during the day, he still talked almost incessantly—the making of worlds being a prevailing topic. In the winter he had an attack of cerebral congestion, unaccompanied by spasms. He roused from the immediate effects of this, but his mind was much more impaired than before. Afterwards he had illusions and delusions simulating those of delirium tremens. He imagined that he saw devils, and struggled in encounters with them.

During the last few weeks of his life it became necessary to feed him, and his bowels were moved only under the effect of powerful cathartics. He was emaciated and ghastly, and his mental faculties almost entirely prostrate. He died on the 2d of May, 1848.

The principal pathological appearances of the brain were as follows: Thickening and opacity of the arachnoid pretty general; bloodvessels enlarged; pia mater much injected; about four ounces of serum in the cranial cavity; substance of the brain generally softened.

In the autumn of 1848, I was requested, by Dr. H. D. Bulkley, to see a patient then under his medical care at the New York Hospital, some of the symptoms of whose case were very similar to those of the partio-general paralysis. The man died soon afterwards, and Dr. J. B. Arden, formerly one of the house physicians of the hospital, furnished me with the following brief history of the case:—

D—— ——, æt. 33 years, resident of New York, boatman. About six months ago the patient had a slight apoplectic attack, from which he so far recovered as to be able to walk about in three or four weeks; but he has never completely recovered the faculties of his mind. He has lost his memory and the ability to recall the appropriate names of objects. He has not complete control over his lower extremities; walks with difficulty and unsteadiness; does not complain of pain in the head. The pupil of the left eye is much the more dilated, but is slightly acted upon by light. General health good.

Nov. 2. Patient remains about the same; has no pains; walks about the hall with the aid of a stick.

Dec. 4. Patient last night had an apoplectic attack, with tonic convulsions, and in about six hours died.

Autopsy, eighteen hours after death.—On opening the cavity of the cranium, there was found a large effusion of blood under the arachnoid membrane and around the medulla oblongata. The lateral and fourth ventricles were filled

with fluid blood, in which were some coagula. There was no marked softening of the brain. The right vertebral and the basilar arteries presented an appearance resembling a varicose vein, or like a string of beads; in other words, there was aneurism of these vessels. The basilar artery was in one point as large as a pea, and this enlargement was situated under the pons Varolii. Other organs healthy, as far as examined.

ART. IV.—*Reports of Cases treated in the Pennsylvania Hospital.* By JOHN H. PACKARD, M. D., late Resident Physician at the Pennsylvania Hospital.

Severe Injuries of the Head.—PERHAPS there is no class of cases in surgery which require the exercise of nicer discrimination or more careful judgment to bring them to a successful issue, than severe injuries of the head, especially those involving fracture of the skull. Rightly to decide when and how to interfere, and when to maintain a "masterly inactivity," how long to deplete, and when properly and safely to stimulate, must always be a matter of peculiar nicety, as well as of weighty responsibility.

In the summer of 1855, several cases of this class were treated in the Pennsylvania Hospital; and it is hoped that the following notes of three of them, taken at the time, may be of interest as bearing on the above-mentioned points:—

CASE I. *Severe Compound Fracture of the Skull, with Compression of the Brain; Recovery without Operation.*—Alex. Macaulay, æt. 22, a baker, of somewhat dissipated habits, was admitted into the Hospital, July 3, 1855, at 7½ P. M.; having shortly before received a severe blow on the head with an iron bar. On the right side of, and parallel to, the sagittal suture, there was a lacerated wound of about four inches in length, and a corresponding fissure in the bone; no depression could be detected, and there had been but slight hemorrhage.

He was entirely insensible, collapsed, and showed symptoms of compression of the brain, such as stertor, and slow, laboured pulse. There was, however, no paralysis, and his pupils were entirely natural.

His head was shaved, the wound closed by adhesive strips, and cold applied; counter-irritation, by means of sinapisms and heaters to the legs and feet, was also ordered.

Drs. Peace and Norris saw him about 10 P. M., but no operation seemed called for.

July 4. Dr. Pancoast saw him, and ordered nitrous powders every 3 hours. Calomel gr. v to be taken at once. P. M. The calomel purge not having acted, I ordered it repeated, and followed by an injection.

5*th*. Pulse 44 in the minute, and full. Insensibility continuing. On bleeding him to f℥xij, his pulse rose to 60. Cups were afterwards applied to the back of his neck, and 30 American leeches over each ear.

6*th*. He showed symptoms of erysipelas, which soon involved the whole scalp and face. This was treated with an ointment of zinci ox. ℥ss; axung. ℥j.

9*th*. He is still stupid; matter discharging freely from an opening made yesterday by Dr. Pancoast, just over the left ear; the original wound healing up very kindly.

10*th*. Gums touched; stopped the powders, and began stimulating him by beef essence, brandy and quinia.

After this, his mind gradually cleared up, and his general condition steadily improved. An abscess formed over the angle of the jaw on the left side, but this healed up well after the discharge of the matter, and

Aug. 9. He left the Hospital, cured.

Case II. *Compound Fracture of the Skull; Recovery.*—G. M. C., æt. 25, an American, of weak mind and dissipated habits, was kicked by a mule, July 6, 1855, at about 9 o'clock P. M.

He was taken into a drug store, and thence, at 10½ P. M., to the Hospital. At this time he was unmanageable, screaming violently when touched, and resisting any attempt at examination of his injuries. These consisted of a lacerated wound about 2 inches long, just over the right superciliary ridge, and an apparently considerable depression of the bone above. The hemorrhage was very slight. His restlessness and excitement were so great that he had to be confined.

Dr. Peace saw him at about midnight, and etherized him with a view of trephining; but being thus enabled to examine the injury more closely, he did not consider the operation as called for. The wound was therefore closed with strips of isinglass plaster, the patient's head shaved, and cold applied, especially over the forehead. He continued very restless and excited through the night, but slept a little towards morning, and became much calmer.

July 7. His condition was much the same, except that he continued calm unless agitated by questions, or by noise in the room. His excitement returned at once if he was at all disturbed. Dr. Pancoast saw him, and ordered a diaphoretic mixture, and low diet.

8*th*. His pulse being slow and laboured, and his restless stupor continuing, he was bled to f℥xvj, with immediate alleviation of those symptoms.

9*th*. Some fever. He was ordered nitrous powders. Diaphoretic mixture also continued.

10*th*. His bowels having been confined a day or two, he was ordered calomel gr. v, to be followed by a purgative enema.

His excitability began to pass into mere peevishness, and he gradually acquired more command of his senses, begging to be allowed to smoke, &c.

The case progressed favourably until

17*th*. He became very uneasy again, so as to require confinement. Some signs of erysipelas appeared on his face; he was placed on the use of stimuli, and the nitrous powders were stopped.

19*th*. He was not so well; stupor increased again; pulse 86, feeble. Increased his stimulus.

20*th*. A good deal of stupor; erysipelas advancing.

21*st*. Stupor less; pulse 44, weak. He had slight diarrhœa, which was not interfered with. Appetite bad; some apparent difficulty in swallowing. Erysipelas fading.

22*d*. He seemed much better; erysipelas nearly gone; diarrhœa much less. Pulse about the same as yesterday; appetite better. As he complained of his feet and legs being cold, they were covered with woollen socks, sprinkled on the inside with Cayenne pepper; a mustard poultice was also applied to the nape of his neck. This application was repeated once or twice afterwards.

He continued to improve, and

26*th.* His friends removed him, apparently quite well.

In January, 1856, I saw him in town, driving his sled, and perfectly well, although of course weak minded, just as before his accident.

Case III. *Concussion of the Brain.*—The following case afforded as interesting an instance as could well be imagined, of the gradual awakening of the mental powers, stupefied by a severe concussion.

J. D., æt. 25, a designer, was admitted to the Hospital at 1 o'clock P. M., August 29, 1855. An hour or two before, he had fallen three stories through a hatchway, striking first, the bystanders thought, upon his right hip.

He was entirely insensible, but restless and somewhat unmanageable. A small puffy tumour existed near the crown of the head, but there was no evidence of any fracture of the skull.

The right lower extremity, from the hip down, had been withered by chronic disease, but presented no mark of recent injury.

He had been treated, before his admission, by cut cups to the nape of the neck, and a hot mustard footbath. His pulse and skin were good; his pupils, though not entirely unaffected by the light, did not answer well to it. He was ordered at once a hot mustard footbath, and a sinapism to the abdomen; also an enema containing ol. terebinth. f℥j, suspended in starch water. Hydr. chlor. mit. gr. vj, were given internally; to be followed by a purge.

8 P. M. No change in his condition; his restlessness made it necessary to confine him. 10 P. M. Bled him to f℥x. Ordered sinapisms, alternately applied to the calves and soles.

Aug. 30, 8 A. M. Bowels not yet moved. Ordered ol. tiglii gtt. ij. 11½ A. M. Dr. Pancoast ordered him an enema of assafœtida ℥j, suspended in a pint of water; a blister to the nape of the neck, and liq. ammon. acet., aq. camphoræ, āā f℥ij, every 2 hours. 10 P. M. Ordered the assafœtida enema repeated. At this time he was apparently completely unconscious, but noisy; crying out, but not talking.

31*st.* Counter-irritation still kept up. Dr. Pancoast ordered a pill of gr. ½ Clutterbuck's elaterium; this opened his bowels well. As he had taken no food of any account since his admission, he was ordered beef essence. P. M. His pupils answer to the light.

Sept. 2. He began to articulate a little.

3*d.* Ordered pil. cath. co. no. ii; a hot mustard footbath at noon, and again at bedtime.

4*th.* The same to be repeated, with the addition of liq. ammon. acet. f℥ss, every 2 hours, and an enema of assafœtida, as before, at bedtime.

6*th.* His mouth being sore, he was ordered an astringent wash. His mind seems a little clearer, and his appetite good, but he has no consciousness of his passages. He takes up his cup of gruel, and drinks, and then after trying to remember what to do with the cup, he drops it on the floor.

7*th.* 8 P. M. So much cerebral excitement that I bled him to about f℥xvj. Ordered an enema containing ℥j of assafœtida to f℥iv of water.

8*th.* Excitement much less. His mind acts very slowly and feebly. If asked a question, he tries to answer, but slowly; and he often has great difficulty in finding the word he wants. Ordered hydr. chlor. mit. gr. ij, potassæ nitr. gr. v, t. d.

9*th.* He cries out "Oh dear!" a great deal; has done so ever since he began to talk, on the 2d. When I asked him why he said that, he said "because he could not think of anything else to say."

10*th*. Pulse 72, skin natural, appetite good. His pupils, when exposed to the light, first contract, and afterwards dilate. He does not know where he is, though more sensible. Powders stopped.

16*th*. He has grown much more rational, but his passages are still involuntary.

18*th*. He was for the first time conscious of his evacuations. He got up during the day, but it caused him some headache in the evening.

After this he steadily improved, still however showing signs of mental weakness, and sometimes slight aberration. Thus he would say positively that he had had no breakfast, when he had just finished a very hearty one.

Oct. 4. He was discharged as cured, though still liable to occasional slight confusion in his ideas.

I saw him in the street, April, 1857; he was looking very well, and seemed perfectly to have recovered the use of his mind.

CASE IV.—*Secondary Hemorrhage occurring fifty-six days after Gunshot Wound of the Thigh; Amputation of Leg; Recovery.*—Samuel Kempner, æt. 21, a boatman, was admitted into the Pennsylvania Hospital, December 12, 1855, at 4 P. M.; having, at 11 A. M. of the same day, received a pistol-ball in his right thigh. He walked into the hospital, apparently without much difficulty.

A small round orifice, with ragged edges, and surrounded by slight inflammatory redness, existed on the inner surface of the thigh, about three inches above the joint; a probe, introduced into it, passed upwards and outwards about two inches, but no ball could be felt.

He was bathed and put to bed; wound dressed with a flaxseed poultice.

Dec. 13. Discovered an ulcer the size of a ten-cent piece, apparently simple in its character, on his penis; he says he has had it for four weeks; has dressed it with burnt alum. This was well cauterized with nitrate of silver, and afterwards dressed with warm water. P. M. Some fever; ordered gr. x of Dover's powder; ol. ricini ℥j, in the morning.

15*th*. Still some fever. Much more swelling, and some redness, around the wound. Suppuration not yet free. P. M. ℞.—Liq. ammon. acet. f℥ss, every two hours.

18*th*. Some little bleeding from the wound. Applied liq. plumbi subac. dilut.

19*th*. Whole thigh somewhat swollen.

20*th*. Swelling somewhat less. Applied a poultice 8 by 10 inches over the wound; lead-water above.

23*d*. General condition good. Discharge from wound free, dark-coloured, and fetid. Posterior part of thigh much indurated. Some cough; ordered syr. scillæ f℥j every two hours.

26*th*. Yesterday and to-day his thigh has been less swollen, and the discharge has been healthier. His knee has become bent and stiffened by lying in the same position so long; but he can extend it better to-day than he could a few days ago. The sore on the penis has healed up.

Jan. 3, 1856. Some fever. A hard, pointed swelling appears to have formed on the back of the thigh, at about the same level as the original wound. The discharge from this latter is very small. Ordered ol. ricini ℥j; gr. x of Dover's powder at bedtime.

5*th*. Fever moderated. Swelling and tension quite marked. Fluctuation being distinct, I made an incision, letting out a large quantity of matter; a poultice was then applied. P. M. The discharge having diminished, I ordered gr. x of Dover's powder at bedtime.

12*th*. He has had a large poultice to the thigh for several days. Very little discharge. Yesterday and to-day he has been feverish. Ordered at bedtime gr. x of Dover's powder, and a diaphoretic mixture.

14*th*. For several days he has had a good deal of pain in the original wound, which discharges a thin, yellow, ropy liquid, like synovia; that from the opening at the back of the thigh is thick and healthy, but not copious.

16*th*. A small spot of fluctuation existing near the last orifice, an opening was made into it and the intermediate skin divided so as to lay them into one.

19*th*. There is a good deal of induration at the back of the thigh. He complains of cramps and numbness in the foot. His knee is a good deal flexed, and on straightening it a considerable discharge is pressed out of the openings.

No important changes in his condition occurred after this till

Feb. 3. An attempt was made yesterday to bring the knee into a straighter position by the use of a good deal of gentle force, and afterwards putting the limb on a double inclined plane. During this attempt he said he felt something give way in the thigh.

To-day he feels weak and feverish, and was ordered nitrous powders.

P. M. Just after my evening visit he was reported to me to be bleeding. I hurried to him, and found a strong arterial jetting from the wound at the back of the thigh; he was quite faint. The hemorrhage was controlled by pressure until a tourniquet could be applied. Some two hours later there was more bleeding, checked by the attendant screwing up the tourniquet. Dr. Peace saw him at about 11 P. M.; applied a horseshoe tourniquet, and ordered anodynes.

6*th*, 7 A. M. Slept none during the night. Has pains and cramps occasionally. The lower part of the thigh is much swelled, and a clot of blood fills and is nearly pushed out of the wound, from which slight oozing has occurred. His face and lips are very pale, and he feels very weak. Ordered a wineglassful of brandy and water.

10½ A. M. A consultation having been called, and ligature of the femoral artery decided on, this operation was performed by Dr. Peace in the usual way. The vessel was very small and its pulsations were so feeble as not to aid in finding it. Brandy had to be freely administered before and during the operation.

After this, free suppuration being established again from the back of the thigh and the wound made in ligating the artery healing kindly, all went on well until

15*th*. Hemorrhage occurred again from the back of the thigh to the amount of about f℥x, but was checked as soon as discovered.

16*th*. A consultation was held, and it was decided to attempt to secure the vessel at the wounded part. Accordingly, the patient being placed on his face on the table and a tourniquet loosely applied (pressure being made on the artery above by the fingers), the wound was enlarged to about six inches, and all the clot turned out. After some search, the upper end of the popliteal artery (the distal portion of the wounded femoral) was found and tied. The cardiac end of the femoral was next secured by scraping away a mass of partially organized clot which surrounded it. (During this part of the operation, the ball was found flattened against the bone, and with some calcareous deposit upon it.) These two ligatures were tightened; a third was placed on another vessel in the wound. The ligatures came away about the ninth or tenth day. Some discharge was kept up from the wound for a good while after.

Much blood was lost and free stimulation called for during the operation, and when removed to his bed the patient was a good deal prostrated; he, however, slowly reacted, and under a course of active and steady stimulation and nutritious diet did very well.

20*th*. Wounds doing well. Pulse 124, and pretty strong. Some discoloration in the foot, especially over the outer malleolus, where much of the pressure has fallen during his confinement to bed. Sensibility impaired on the anterior and under part of the foot.

The ligature came away about the eighth day.

This discoloration and loss of sensibility became more and more marked until the whole foot and leg passed into the condition of dry gangrene; the fibula and several bones of the tarsus being laid quite bare in the course of this process. His general condition remained pretty good, but of course he required a supporting treatment.

July 16. The line of demarcation being clearly formed, and the patient's condition good, Dr. Peace amputated the leg just below the knee. Ether was given, and the operation was done by the circular method; the arteries were very small, only five or six requiring ligature; one, in the substance of the popliteal nerve, bled quite freely and was tied.

After this he had not a single bad symptom, and, on August 21, he was discharged cured, having been 253 days under treatment.

I have been unable to find any case reported in which secondary hemorrhage occurred later than the thirtieth day; and the subject is only mentioned in a cursory manner in most works on surgery. The above case may, therefore, be of interest and practical benefit, as illustrating the impossibility of laying down any precise limits to the period of danger from hemorrhage, and the necessity of constant watchfulness and attention to the processes going on in each particular case.

ART. V.—*Statistics of Obstetrical Cases.* By DANIEL PIERSON, M. D., Augusta, Ill. (*Prepared for, and read before the Hancock Co. (Ill.) Medical Association, and communicated to the Am. Journ. Med. Sci. for publication, in compliance with a vote of the Society.*)

I CANNOT suppose that the brief statistics herewith presented will be considered of great importance, or novel; but the hope of inducing some members of the profession to take sufficient interest to examine and note interesting points in cases under observation, and thus to add to the reliability of the statistical tables already furnished, as well as to refute errors and false statements that have been published, prompts me to add my mite, without any favourite theory or hobby to advocate.

It is too much the habit of many to follow in the wake of those who have gone before, without taking the trouble to stop and think—receiving their statements as truth, and yielding a ready assent to the hypotheses advanced, or the suppositions adduced as facts. The only way that truth can be surely

discovered is by patient investigation, by collecting and collating isolated facts, and instituting full and free inquiry as to the validity of the points in question.

I am aware that it may be said of the statistics now presented, that the number of cases is too limited to have any direct and important bearing to the points set forth. It is but the multiplication of streamlets that forms the mass of the "father of waters," which is able to bear on its current the produce and population of the most flourishing nation of the universe; and it is by the accumulation and combination of single facts, that great truths and important principles are established.

The abstract of cases from which the following is condensed, I have kept for some time for my own gratification and reference, not thinking, till recently, of presenting it to the profession; but it occurred to me that it might interest some one curious in such matters.

I find by referring to my abstract, that of the cases of obstetrics that have fallen under my care, I have noted *two hundred and seventy-four.* I regret that I have not kept note of a larger number, as well as more full details, and upon some points not noted. I should perhaps have stated before that I do not claim originality as to the manner of arrangement; but received the plan from the paper of Jno. Geo. Metcalf, M. D., in *Am. Journ. of Med. Sci.*, for Oct., 1847.

1. The 274 cases of delivery gave birth to 279 children, there being five cases of twins, being 1 to 54¾, or nearly two per cent.

2. Of the 274 mothers, 272 were married, two were unmarried, and one had been but three months—making three illegitimate children at least, or 1 to 91¼. The mothers of the illegitimate children were all young; the oldest 23 years; the others about 16 or 17. One claimed her size to be due to an enlarged spleen, "*ague-cake*" of five years' standing, and denied being pregnant till the last extremity. One being obliged from the constant increasing size to admit the fact, claimed to be only three months advanced in pregnancy, unless "*she was eighteen months gone;*" but was soon delivered of a proper nine months child. The husband of the married one proved himself innocent of being father to the child, as he was unacquainted with his wife till a few weeks before marriage.

3. Of the 274 cases the whole number of times each had been pregnant, was ascertained in 250, and were as follows: 1st pregnancy, 56; 2d, 48; 3d, 47; 4th, 32; 5th, 19; 6th, 14; 7th, 14; 8th, 8; 9th, 4; 10th, 4; 11th, 2; 12th, 1; 15th, 1; making a total of 887 pregnancies to the 250 patients, or an average of a little over 3½ to each mother, which goes far to show that the majority were young. We frequently find a difficulty in ascertaining with certainty the number of previous pregnancies, as they are often mute concerning abortions.

4. *Duration of Labour.*—It is perhaps the most difficult of all to state the *exact* duration of labour, from the fact that women themselves date its com-

mencement from very different times; some from the first uneasy sensation indicating its approach; others from the intervention of true expulsive labour pains. I have endeavoured as far as possible to follow the latter. I have rarely if ever known the beginning of labour protracted more than 24 hours after there has been a bloody discharge called the "*show*," though I have known one case where there was a rupture of the membranes, and a discharge of the amniotic fluid eight days before labour, and one fifteen days, another twenty-nine days, and another forty days previous to confinement; in each there was a full and free discharge at first, and then a dribbling of water until labour; but in neither was there any discharge of water during labour, and all had unusually easy and speedy labours, and the children all did well. Of the 274 cases I have noted the duration in 228; and of this number I find 221 completed within 12 hours, and only 7 over that period; they were as follows: 2 in ¼ of an hour, 6 in 1 hour, 1 in 1½ hour, 20 in 2 hours, 1 in 2½ hours, 34 in 3 hours, 43 in 4 hours, 17 in 5 hours, 48 in 6 hours, 1 in 6½ hours, 7 in 7 hours, 18 in 8 hours, 5 in 9 hours, 10 in 10 hours, 1 in 11 hours, 9 in 12 hours, 1 in 13 hours, 1 in 15 hours, 1 in 18 hours, 1 in 22 hours, 1 in 23 hours, 1 in 24 hours, 1 in 30 hours, averaging nearly 6½ hours. The case that was protracted to 30 hours was, as it were, compelled to it as follows. The patient, a young woman, *primipara*, close built, and carrying a large child; a "*granny*" was called to attend, who at every examination, and that very frequent for the first stages of labour, thrust her whole hand into the vagina; following up this procedure at almost every pain, producing of course great swelling and violent inflammation of the parts; the friends at length became dissatisfied, and sent for a neighbouring physician, but being unable to get him, sent for a Thompsonian, he being the nearest help to be obtained, who only bettered the case by not permitting the midwife to examine the patient quite so frequently, though she had charge of the case with him. But as the labour progressed, the head of the child was delayed by the rigidity and swelling of the soft parts; then, in a quandary, the "*steam doctor*" *and the* "*granny*" held a consultation, and came to the sage conclusion, that "*something was the matter, and that something must be done*," and that they "*must get a new start;*" and to that end they decided upon the following plan to accomplish it: *They placed the patient topsy-turvy, standing her upon her head, spread her limbs apart, and forced the child back by direct pressure upon the head.* The patient was exhausted by this procedure, and it was some time before pains returned. They became alarmed, and sent for me in great haste, "to go and cut the child in pieces, as it could not be born whole." I found the patient completely prostrated, with but slight pains: there was intense inflammation and swelling of the vagina and external parts, so much so that she could scarcely bear the most careful touch; found the child dead; patient said it had been ever since they forced it back. Administered an opiate, and enjoined perfect quiet and rest. When she had obtained a little sleep,

she roused up refreshed, pains came on with force, and was soon delivered of a fine plump child, entirely by the efforts of nature.

5. *Flooding* is noted to have occurred between the 6th and 9th month in 6 cases; during labour and before delivery in 12 cases; between the birth of the child and the expulsion of the placenta in 12 cases. In cases of flooding before the birth of the child, I found it greatly moderated by the rupture of the membranes, when between the birth of the child and the delivery of the placenta, by exciting the uterus to action and delivery of the same; if not, by the use of opium and sugar of lead, or direct cold applications. In only three cases did it become alarming, and two of those were placental presentations. In the case that assumed the most alarming symptoms, the patient, a stout and robust woman, expecting daily to be confined, was suddenly awakened at night by what she supposed to be the rupture of the membranes and escape of the liquor amnii. She called her husband to go for me as quick as possible, but before he could dress she discovered her situation, and he instantly started for me. I saw her in a few moments, and found her in a pool of blood from her shoulders to her feet, perfectly prostrated, yet flowing in a rapid stream, and without the slightest pain. Upon examination found the uterus high up, and the os uteri but slightly dilated, though not rigid. I was enabled to discover that it was a placental presentation. During examination slight pains came on and arrested the hemorrhage for a short time; but the pains relaxed and the flooding returned. A similar proceeding produced like results, but no more permanent effect. I endeavoured to induce pains, but without avail. Decided to proceed at once to turn to deliver (contrary as it is to all authority to do it in the absence of pain), but I saw the patient must die if I waited, and knowing that she could not do worse if I proceeded, thought I would be found *trying* for the best. Candidly stating to the patient and her friends the nature and danger of the case, and telling them that according to statistics there was only about one chance in ten to save her, they readily and freely submitted to my judgment, and wished me to proceed as quick as possible. Found some difficulty in dilating the os uteri so as not to detach the placenta entirely. The child was high up, and the membranes unbroken; ruptured them, and proceeded to turn and deliver as carefully as possible. During the operation slight pains came on, and the womb contracted slowly; delivered her of a fine large child, weighing 12 pounds, but dead. Removed the placenta, and by the most perfect quiet and composure, dangerous hemorrhage was averted; but for forty-eight hours the slightest effort, even to raise a hand, or turn her head, or move a foot, reproduced flowing that could alone be arrested by the application of cold water to the pubic region, and that had to be continued for some time before it would succeed, but directed always to desist when it caused a chill to the patient. She ultimately had a rapid and favourable recovery.

6. *Convulsions* occurred four times in the 274 cases, in three before and in one after delivery. One of each was very slight. In one case the patient

was in most violent convulsions for five hours before I saw her—presumed to be caused by violence received from a drunken husband—she was in her eighth month. By copious bleeding and free use of antimony, the convulsions were mitigated, but continued slightly till the child was born, after which she remained in a perfectly comatose state for forty-eight hours, when she ceased to breathe; she never appeared to be conscious but for a moment or two at a time (and that but twice) after I first saw her. The others all recovered.

7. *Puerperal Fever,* in five cases—about 1 in 55, including puerperal peritonitis and metritis, proving fatal in but one case.

8. *Presentation.*—Of the 279 children the presentation is noted in 265 cases, as follows: vertex, 232; occiput, 20; face to the pubis, 3; foot, 3; foot and knee, 1; face, 1; breech, 1; side, 1; placental, 2. Two of the foot-presentations were twins. The above shows a very large per cent. were vertex, and about five per cent. occipital; the percentage of the other very small. One case of face to pubis was complicated with funis presentation; labour tedious, and child still-born.

9. *Sex.*—Of the 279 children the sex is noted in 270, viz., males, 144; females, 126, being a majority of 18 males.

10. *Weight.*—Of the 279 children, the weight was ascertained in 248; of these, 235 were at full time; the aggregate weight of the 235 was 1923 lbs., being an average of a little over 8 lbs.; there were 88 that weighed 9 lbs. and over, and 28 that weighed 10 lbs. and over; the heaviest weighed over 12 lbs.

11. *Diseased.*—Of the 279 children, 3 are noted as diseased; 2 of which had hydrocephalus, the other not stated.

12. *Deformed.*—None, unless we except one born with a prominence on the left clavicle, which I doubt not was caused by an intra-uterine fracture, but had become united. The mother had fallen, some six weeks previous, on the edge of a board, which hurt her very much at the time.

13. *Dead-born.*—Of the 279 children 19 were stillborn, being nearly 1 in 14; of these, but 7 were at full time; 2 had been dead for some time, and were putrid; 1 was killed by an officious granny. Those that were not at full time were 2 at 2d month, 4 at 3d month, 1 at 6th month, 2 at 7th month, 1 at 8th month, and 2 at 8½ month.

14. *Month of Delivery.*—The periods at which the 279 children were delivered are thus noted—*Month of Pregnancy:*—

No. . . .	2	4	1	1	2	1	3	1	6	5	252	1
Month . .	2'	3'	4'	5'	6'	6½'	7'	7½'	8'	8½'	9'	10'

If we call all before six months abortions, and after that and before nine months miscarriages, we have eight cases of abortion and nineteen miscarriages. Though I have not much faith in prolonged gestation, I have one noted as such—but many have claimed that they have gone over their time—in this case I thought the patient's reasons were good, if ever they are.

It will be seen that the child born at five months is not placed among the stillborn; I have no reason to think that the mother was further advanced than that, and she thought not quite that; yet the child lived for half an hour at least. The child that was born at six and a half months lived some six hours; the mother was in the last stages of cancer of the breast, and though she rallied well after delivery, she lived but about twelve hours.

15. *Month of the Year the Children were born*, is noted as follows:—

January, 32; February, 21; March, 30; April, 26; May, 17; June, 14; July, 22; August, 26; September, 27; October, 22; November, 15; December, 27. Which was, during the Spring months, 74; Summer, 62; Autumn, 64; Winter, 80.

16. *Hour of Delivery.*—Of the 279 children, 166 were born between midnight and noon, and 113 between noon and midnight.

17. *Twins.*—In the 274 cases of delivery there were five in which there were twins. In three cases both children were females, in the other two both were males. In one case, there was but twelve minutes between the birth of the children; in two cases fifteen minutes, each; one case half an hour, and the other one hour and ten minutes. In two of the cases there were two placentas for each pair, but united together. In two cases but one placenta for each pair, and in the other case two separate placentas. In three of the cases both of the children were vertex-presentations; in each of the others one child presented head and the other foot.

18. *Force Deliveries.*—In the 274 cases of delivery, force was used in but three cases; two of those were placental presentations, when version and delivery were necessary to save the mothers. In the other, craniotomy was performed on a dead child to save the mother, who was rapidly sinking, but, by the free use of stimulus after delivery, she had a favourable recovery.

19. *Time between Birth of Child and Delivery of Placenta*, is noted in 252 cases, and were as follows: four were expelled *immediately after or with the child*—1 in 2 minutes, 2 in 3 minutes, 73 in 5 minutes, 14 in 7 minutes, 5 in 8 minutes, 94 in 10 minutes, 6 in 12 minutes, 29 in 15 minutes, 4 in 20 minutes, 5 in 30 minutes, 2 in 40 minutes, 1 in 45 minutes, 2 in 60 minutes, 1 in 1 hour and 20 minutes, 2 in 1 hour and 30 minutes, 3 in 2 hours, 1 in 2 hours and 30 minutes, 1 in 24 hours.

It may be well to state that so soon as the child is handed to the nurse, my practice is to place my hand upon the abdomen of the mother, and if the uterus is contracted upon the placenta, without further delay I take hold of the cord and tighten it, though not to apply force, and generally pains soon supervene and discharge the placenta. I have had several cases of hour-glass contraction of the uterus retaining the placenta in the upper portion, when it has been necessary to introduce the hand to deliver it. The case that was delayed twenty-four hours, I was merely called to deliver the placenta; the physician that attended during labour—which was premature—left without delivering it, though he told them that he had found no difficulty in the

case except that it was very frail. There were one or two cases where the placenta was ossified, or points of ossification through the whole mass, and would break with decided crepitation.

20. *Position of Placenta* is noted in 162 cases; in 90 it was attached to the left side of the uterus, 47 to the right side, 13 to the anterior, 5 to the posterior, 5 to the fundus, and 2 to the os or cervix uteri.

I have used ergot frequently without harm to mother or child, and sometimes greatly to the relief of a worn-out *patience*, but never, unless the os uteri is *fully* dilated, and there is a cessation of labour-pains.

Ether I have also administered in numerous cases, in all with great relief, some more than others, and have not known ill effects in any case. I have not used chloroform.

I have known at least two cases where menstruation has been regular during the entire period of pregnancy.

Absence of Lochia.—I have known two cases where the patients did not lose, one not a drop, and the other not a spoonful of blood during labour or afterwards, and had no lochial discharge during convalescence, and yet both had a safe and rapid recovery.

Colourless Lochia.—I have also had several cases come under my observation, in which the lochial discharge was so devoid of colour as not to stain the clothes, and yet the patients did well.

We can easily conceive of a case that might require legal investigation, where there had been uninterrupted menstruation during pregnancy, followed by an absence of lochia or a colourless discharge—which might lead to some difficulty in coming to a just decision.

Unbroken Hymen.—I was called to attend upon a lady in labour, who had been married about a year, and upon making an examination to discover the progress of the labour, found that the hymen was unbroken, the orifice not being large enough to admit the tip of my finger. It was ruptured without difficulty, and the case had a happy issue.

Occlusion of the Vagina.—A case of almost complete occlusion of the vagina, caused by officious handling and unwarrantable abuse during a previous labour, producing violent inflammation and adhesion of the wall of the vagina to such an extent that the patient and her husband thought it impossible for her to become pregnant, and would not believe that she was so, till forced by attending circumstances to admit the fact. When labour supervened, I was sent for—about thirteen miles;—when I arrived, found her under the most violent expulsive pains, and the only orifice thus fully dilated would not more than admit a goose-quill. I explained the nature of the case, and the danger of an operation under such circumstances, viz., of vesico-vaginal and recto-vaginal fistulæ—from the ease with which the divided parts would tear, and thus extend to the rectum and bladder. But being urged to prompt action by the patient and her friends, and knowing that the only recourse was to operate

with care, and endeavour to support the parts during the progress of labour, I proceeded with a probe-pointed bistoury to enlarge the opening, and so soon as possible to explore with my left index finger as I advanced. The complete and firm adhesion was from one half inch at the anterior, to one and one-half inches at the posterior part of the vagina, the whole distance cutting through solid flesh or cicatrix. The adhesion was from the internal labia inward. There were also several large and rigid cicatrices still farther inward, that I was obliged to divide before the head of the child could pass—as they were hard and unyielding bands that would not admit of distension more than a whip-cord.

As I feared, and stated to the patient, the cut surface lacerated posteriorly to the rectum, producing a *very small* recto-vaginal fistula, though so small as never to trouble her; it also tore anteriorly to the neck of the bladder, producing a vesico-vaginal fistula—for which I have operated, and she has since been entirely relieved from all trouble on that account. I have since attended her during labour, and she had in every respect a favourable labour and convalescence. In a medico-legal point of view, the two preceding cases go to show that pregnancy may take place without the introduction of the penis.

I have one patient in whom the secretion of milk took place at four and a half months of pregnancy—she went her full time, and "never had a dry bosom for an hour at a time, for four and a half months before delivery." The secretion was very copious.

One child numbered in the foregoing abstract was born with the membranes entire—it was the last of a pair of twins at eight and a half months.

One child was born with leucorrhœa, which lasted two days, when occurred a regular appearing menstrual discharge, which continued four days.

Pregnancy without sexual pleasure.—A very intelligent lady, who has been married for some time, had the usual symptoms of pregnancy, and the object of her inquiry was, whether such could be the case, whereas she had *never enjoyed the least pleasure during copulation*, but it was to her a matter of indifference, so far as desires were concerned; yet the result proved that she was then some three or four months advanced in pregnancy. She is a lady whose word is above suspicion, and her very manner of inquiry would forbid the thought of it, and she was desirous to know wherefore these symptoms, when she thought pregnancy out of the question under the circumstances.

I have known also two other very similar cases, in which there was no pleasure arising from coition, and in one it was *always a matter of repugnance*, and still pregnancy took place. One patient that had been pregnant six or eight times, has always become so whilst in the act of menstruating, and she believes that in her case it would be impossible to become so at any other time.

As already said, I am aware there is little or nothing in this paper to ex-

cite wonder, and some of the latter statements may not be considered in place in connection with the abstract; but I report them as growing out of the same cases, and on account of their rarity.

Augusta, Ill., *April*, 1857.

Art. VI.—*Chlorate of Potash in Mercurial Stomatitis.* By Thomas J. Gallaher, M. D., one of the Physicians to the Western Pennsylvania Hospital, Pittsburg.

Mercurial stomatitis is a most loathsome and obstinate complaint. Slight attacks of this affection are comparatively of but little consequence, for, with proper precautions as to exposure, they will mostly disappear in a short time without remedial measures being resorted to. More grave forms, however, in which the gums become very sore, the tongue swollen, the mucous membrane of the mouth ulcerated, the salivary and other glands in the vicinity of the neck enlarged and tender, the breath fetid, the jaws stiffened, deglutition difficult, salivary secretion increased, &c., are of more serious import, and demand the attention of the physician. If a case of this kind be left to itself, or if merely palliatives be employed, it will generally last some weeks, and it may be months before its complete removal by nature is effected.

Many remedies have been suggested and various plans of treatment tried for the removal of this artificial malady; but none, until the chlorate of potash was proposed, met the wants of the profession, and none gave general satisfaction. Recent authors have generally contented themselves with recommending exposure to a warm dry air, cathartic medicines, topical depletion, and the local application of numerous washes—demulcent, astringent, and stimulating—to the inflamed parts. How uncertain and unsatisfactory these means have been, the profession everywhere can answer. For my part, I may say that I have often been so dissatisfied with the slowness with which mercurial sore throat disappeared under this treatment, that I thought no good was derived from it further than temporary amelioration of disagreeable symptoms and preservation from external injurious influences. This treatment is eminently palliative—not specific. Present relief is afforded—while the affection is allowed, in a great measure, to run its own course.

Recently, a new remedy has been proposed which, from a pretty extensive employment of it, I now regard as much a specific for mercurial stomatitis as quinia is for intermittent fever.

Ihr was the first to recommend the use of the chlorate of potash in ulceration of the mouth following salivation, but to Messrs. Herpin and Blache, of Geneva, are we indebted for a more full and satisfactory account of the

beneficial effects of this salt in mercurial stomatitis *in all its forms and stages.* The first account of the discovery of these eminent physicians which appeared in this country, was published, I believe, in the April No. of the *American Journal* for 1855. Since that time I have had frequent opportunities for employing it, and uniformly with success. I have seen ordinary mercurial stomatitis disappear under its use in a few days, while the most loathsome forms have been observed to yield in ten. Judging from past experience, I now, with the use of this salt, can remove a mercurial disease of the mouth in from six to ten days, which, under any other proposed plan of treatment, would last from four to six weeks. I may say that I have found it equally beneficial in all stages and degrees of salivation, as well as in ulceration of the mucous membrane of the mouth, which sometimes remains after the other symptoms have disappeared.

My method of treating a patient affected with this disease is as follows: He is placed in a warm and comfortable apartment, and made to live on gruel. I then order him ten grains of the chlorate of potash, dissolved in a tablespoonful of cold water, three or four times a day, according to the severity of the affection. Should there be ulceration of any portion of the mucous membrane of the mouth, I direct a weak solution of the salt to be applied to the denuded part several times a day. Generally, nothing else is required—the cure being accomplished in a few days. To illustrate more fully the effect of this remedy, I have appended a few cases, which have been selected from quite a number that have fallen under my notice.

Case I. The first case in which I had an opportunity of employing this remedy, was in May, 1855, on the person of a young lady, aged 26 years. Blue mass pills had been given her pretty liberally, by the family, for some imagined illness, until her gums and mouth became so sore that it was with difficulty she could swallow food. After suffering some days under these symptoms, I was called to visit her. I found her breath fetid, gums sore, mucous membrane of the mouth partially ulcerated, and other unmistakable evidences of confirmed salivation. For a few days I gave the usual mouth washes, a gentle cathartic, and required her to remain confined to her room. For about one week she used the means I suggested, with but little advantage. At this time I was made acquainted with the good effects of chlorate of potash in mercurial stomatitis, and at once determined to put it to the test. I accordingly prescribed it as follows: ℞.—Potass. chlorat. ʒij; aquæ ℥vj.—M. One tablespoonful of this solution to be taken three times a day. I saw the patient two days afterwards, and found her much better. Her mouth had commenced to heal, the mercurial fetor of the breath had diminished, and she felt able to swallow food. In a week from this time the disease was entirely removed.

The speedy relief obtained in this case gave me some confidence in the new remedy, and satisfied me that it was worthy of further trial. An opportunity soon occurred.

Case II. Miss C——, aged 23 years, while employed in the capacity of a dry nurse, was attacked in the spring of 1856, with severe neuralgia of the

right side of the head and upper part of the face. The physician to the family in which she for the present resided was called to see her, who pronounced it disease of the brain. Powders containing calomel were ordered. She took the medicine a few days, but her mouth becoming very sore, and her sufferings not being alleviated but rather increased, her friends determined to take her home and send for their family physician. I found the patient labouring under remitting hemicrania of most excruciating severity, accompanied with mercurial salivation. The severity of the symptoms requiring active medication, I ordered at once remedies both for the neuralgia and sore mouth. A liniment, composed of chloroform and olive oil, was ordered to be applied to the head and temples, and ten grains of the sulph. of quinia to be given night and morning, for the former, while ten grains of the chlorate of potash, three times a day, was prescribed for the latter affection. In three days the hemicranial pain had subsided, when the quinia was suspended. The sore mouth had, in the mean time, improved. Four days' more employment of the chlorate stopped the salivary discharge, and healed up the mouth. The cure was prompt and decisive.

Case III. In January, 1857, I was called to visit a Mrs. M——, who complained of a bad breath, sore mouth, loss of appetite, &c. I learned that, about one week previous to my visit, she had taken some anti-bilious pills, which were supposed to contain mercury. An examination of the mouth told at once the cause of her sufferings. She was severely salivated. Nothing had been done, further than a Dover's powder had been taken at bedtime, to work the cold off, as she expressed it, and an alum wash for the mouth had been used freely. It may not be improper to state that no advantage was derived from these. The patient was directed to remain in her room, live on spoon diet, and take the chlorate in ten grain doses, three times a day. On my visit the following day, she was much better, and declared the first dose helped her. A continuance in the remedy effected a perfect cure in a few days.

Case IV. This was a case of ulceration of the mouth following salivation. It was of nearly three weeks' continuance, and many local applications, including nitrate of silver, had been ineffectually made to it. I gave the chlorate in the usual form and frequency, and ordered the ulcer—which was situated beneath the tongue, of large size and very painful—to be washed several times a day with a weak solution of the same, and had the satisfaction of seeing it heal up in five days.

Art. VII.—*Chlorate of Potash Injections in Leucorrhœa and Ulceration of the Os Uteri.* By Bedford Brown, M. D., Caswell County, N. C.

Knowing the peculiar and happy curative influence exerted by chlorate of potash in external ulcerations attended with vitiated discharges, and having been so often disappointed by the usual modes of treating such cases, the great difficulty of which all medical men acknowledge, I determined to experiment with injections of a solution of that salt in ulceration of the os uteri and cervical canal attended with leucorrhœa.

The discovery of some simple and efficient means as a substitute for the uncertain astringent injections in common use, and the tedious and often unsuccessful caustic and speculum, would relieve the physician of an extremely disagreeable duty, and the patient of an almost intolerable necessity.

In those cases of leucorrhœa attended with ulceration of the os uteri or cervical canal, and enlargement of the muciparous glands of the vagina, or simple ulceration without leucorrhœa, I believe the injections of the chlorate far more certain and efficient than the ordinary astringent injections, or the local application of caustic. In these cases I have not thought proper to give detailed reports of their symptoms and progress.

Case I. A coloured woman, aged 30, who had never borne children, and had, from early life, complained of symptoms of uterine disease. At the time she came under my charge, she had profuse leucorrhœa. On examination with the speculum, the entire vaginal canal was seen highly inflamed—the os uteri very tumid, with numerous large ulcers. This woman used, by injection, a solution of the chlorate, in the proportion of ℥j of the salt, dissolved in ℥viij of rain water. As much of this as an ordinary female syringe contains was used twice daily. Under its influence the ulceration and inflammation, with the attendant leucorrhœa, diminished rapidly, and in two weeks all indications of disease had disappeared. In this case, the locality of the disease was confined to the vagina and the os uteri.

Case II. To digress from the subject, I would report the present case as illustrating the equal powers of the chlorate of potash in gonorrhœa of the female. This patient, an unmarried female had suffered from gonorrhœal disease, until the vaginal inflammation had become excessive with very copious, purulent, and exhausting discharges, accompanied by so much tenderness and pain as entirely to preclude the use of the speculum. The difficulty and pain of urination were such as to compel me to use the catheter frequently. The same treatment as in the previous case was adopted, and with equal success. In fact, this patient (servant) who had been perfectly disabled, in ten days after using the chlorate injections, was attending to her ordinary duties.

I strongly conjecture that gonorrhœa of the male would be equally amenable to the same treatment; and, as soon as the first opportunity presents, I design testing it. If so, a new era will be introduced in the management of that intractable disease.

Case III. This was an example of leucorrhœa originating from ulceration of the os uteri and inflammation of the cervical canal. The woman was married, and had been confined prematurely three months previous. She used the chlorate of potash injections, and remained in the recumbent position for some hours after each injection. She found equal benefit from the remedy, and is now attending to her customary duties, without any of her former symptoms.

Cases IV. and V. In these cases there was ulceration of the os uteri and cervix, with very slight leucorrhœa, though suffering from the ordinary annoying symptoms of uterine affection. I both cases, the chlorate in solution healed the ulcerations in between two and three weeks, with signal relief to the patient.

To sum up briefly, those conditions to which the chlorate of potash injections are applicable, I would say those cases are appropriate, wherein ulceration and inflammation are confined to the os uteri and cervical canal and vagina, either with or without leucorrhœa.

ART. VIII.—*The Use of Water in the Treatment of Fever.* By ISAAC CASSELBERRY, M. D., Evansville, Ind.

Anatomy.—The skin has, in man, a superficies of about fifteen square feet. It is composed of three coats: an outer, called the cuticle, or *epidermis*, of a horny nature; a middle, of a soft pulpy consistence called *rete mucosum*, or mucous body; and an inner, of a dense resisting character called the true skin or chorion.

On the upper surface of the true skin are distributed, in great profusion, nerves and small vessels; some of these vessels convey blood; others, lymph; surrounding and penetrating the coats of these vessels to their most minute distribution are the automatic nervous branches. This is the nerve of the blood, absorbent, and secretory vessels; and wherever they ramify they carry along with them minute branches of this nervous system. It creates, maintains, and governs the functions of these vessels.

The cuticle has no sensibility, and is, therefore, wonderfully adapted to the protection of the nerves, glands, and vessels of the other coats. It has openings, or pores, which admit the escape of perspirable matter and certain gases secreted by the glands under the mucus coat and upon the true skin. These openings are not direct communications; they go some way obliquely under the cuticle before they open externally. On the upper surface of the true skin and immediately under the mucous coat are a countless number of glands of secretion and of absorption. Some of these glands display functions nearly identical with those of the lungs in respiration. They secrete the same gases and absorb the same gas as the lungs.

The community of function between some of the glands of the skin and those of the lungs is so nearly identical, that, in some animals, as the common leech, both are performed by the skin; and in others, as the frog, which will survive longer the excision of the lungs than the loss of the skin.

The skin has a continuity of structure with the lining membrane of the respiratory, the digestive, the urinary, and the uterine passages. This is the physiological reason why the states of the skin both modify and are modified by the functions of respiration, digestion, and urination. The mucous coat of the skin, in some degree, protects the vessels, nerves, and glands from compression and contusion. While the cuticle is hard and the true skin firm, this is soft and yielding. The cutaneous glands have a perfect glandular organ-

ization. The arterial, venous, lymphatic, and capillary vessels, and the automatic nervous branches, minutely ramify through its structure.

Physiology.—Blood, rich in nutritive and effete elements, is conveyed along the arteries to the capillaries in which it undergoes a series of cellular changes, by which the nutritive are separated from the effete. Each class of these elements undergoes further molecular changes by which the former is prepared and appropriated to the nutrition of the different external tissues; while the latter is elaborated and coalesced into various secretory elements, and removed from the cutaneous tissues in the form of compounds, as sweat, carbonic acid gas, &c. These molecular mutations are accelerated by the absorption of oxygen from the atmosphere by certain cutaneous glands in a mode nearly identical with that in which the lungs absorb atmospheric oxygen; and oxygen in the external capillaries combines with the carbon of the food, evolves heat, and is removed by secretory action in the form of carbonic gas. When these elements are combined in the lungs heat is evolved, and carbonic gas formed and secreted.

Are not the functions of the lungs and those of the skin, in this particular, identical? They certainly produce the same results.

When the blood arrives in the external capillaries its elementary composition is not the same as when it was returned from the lungs into the left side of the heart, because it is a living and growing fluid. From the time the organizing force of the automatic nervous branches at the mouths of the absorbent vessels begins to act on the organizable elements of the food and drink until the blood is conveyed to the tissues it is designed to nourish, it is in a state of constant growth, when it attains maturity and is appropriated. Every tissue of the organism is nourished by its own capillary vessels designed for that particular purpose. The living circulating mass supplies the material out of which the automatic nervous force of these vessels elaborates and appropriates the nourishment of the tissues. When the blood is normal the different forms of the automatic nervous force readily obtain a supply of nutrient material; and all the functions of the organism are performed with comfort and regularity.

Not only the blood has a period of incipiency, growth, and maturity, but so, also, has each cell of which it is composed. For practical purposes, the cells of the blood may be arranged into two classes: one, to nourish and build up; the other, to tear down and remove. When the human organism arrives at maturity they should be exactly equal to each other. From this physiological fact it is evident that a normal quantity of blood must be conveyed into the external capillaries, in which it must undergo normal molecular changes in order to maintain the external tissues in a healthy condition.

Pathology.—If, from any cause, the blood is not conveyed to these vessels in normal quantity and quality, the temperature of the skin will be abnormal. This is fully evinced in every state of fever, from its incipiency to its termination. I have endeavored to show that the automatic nervous system creates,

maintains, and governs the circulation of the blood, and produces all the molecular changes which occur in the capillaries (*Amer. Med. Journ.*, July, 1855); and that, therefore, the primary link in the series of functional lesions which produce *fever* must be a lesion of this force in these vessels (*Amer. Med. Journ.*, April, 1856).

From the physical position and anatomical structure of the arterial, capillary, and venous systems of the skin, and from their physiological relation of function to that of these systems in the other great depuratory glands, the liver, the kidneys, and the lungs, it is evident that the primary impression of the electrical disturbance in the atmosphere, the disturbing force of which produces a lesion of the automatic nervous force, must first take place in these vessels.

The degree of lesion between the elements of the blood in the external capillaries depends on that of the electrical disturbance, and that of the resistance to the force of this disturbing cause offered by the organism. It may be slight, when it will soon be removed by the superior force of the different forms of the normal automatic nervous force in these vessels. But each time this lesion is produced by an electrical disturbance in the atmosphere, the less the degree of resistance offered by the organism; so that by the frequent repetition of the electrical disturbance, although it may not be, at any time, increased in intensity, a diseased state of all the elements of the blood will be gradually produced. This is fully evinced by the ordinary symptoms of fever.

The disturbing force of electricity may be of sufficient intensity and duration to produce a diseased transformation of all the tissues in a few hours. Then the most malignant symptoms of fever are manifested. When fever is produced in the former mode, by the gradual disturbance of the normal relation between the elements of the blood, the skin is either hot and dry, or cool and bathed in perspiration.

During the progress of fever the skin often communicates the sensation of increased heat, when its temperature, as indicated by the thermometer, is not augmented, because the skin, when dry, is a better conductor than when moist, and because no increments of heat are lost by transmutation into mechanical force by which sweat is driven from the surface. The sufferer often imagines he is almost burning up, when the temperature of the skin evinces no increase of heat. Why is this?

The pathology of the blood reveals the answer. All of its elements are in a state of diseased transformation. The different forms of the automatic nervous force normally manifested as nutritive attraction by which the tissues are nourished, and effete repulsion, by which they are freed of effete elements, are, in some degree, changed into abnormal or chemical force. Hence the elements of the blood are abnormally transformed; they do not nourish the tissues, but they are the agents used by the chemical force to facilitate the molecular decomposition of the solid tissues. The organizing force of the digestive organs no longer attracts the organizable elements of the food. New

material for normal blood is not absorbed and elaborated. The growth of the blood is soon arrested when the superior quantity of the augmented chemical force transmutes its elements abnormally and produces their re-arrangement in accordance with chemical laws.

When the elements of the blood are abnormally transformed, the albuminous undergo imperfect molecular development. The organizing force of these elements attracts the oxygen of the atmosphere imperfectly, because of their deficient molecular arrangement in the pulmonic and cutaneous capillaries. A limited quantity only is absorbed. This oxygen is an important nutritive constituent of the albuminous compounds. They cannot attain perfect molecular growth without its elementary combination with the other elements of the protein compounds. When, from any cause, this combination is imperfect, the molecular development of the protein compounds must therefore partake of this imperfection. The automatic nervous force, which is manifested between the elements of these compounds in the form of nutritive attraction, is increased in some capillaries, decreased in others, and perverted in all.

When the organizing force of the protein elements is in this manner disturbed, they may attract the oxygen of the atmosphere, and cause its absorption, either by the pulmonic or cutaneous capillaries; but, when absorbed, it cannot undergo normal cellular development and combination with the other elements of the protein compounds, because of the lesion of the organizing or nutritive force. Its presence sometimes gives perverted motion, but always diminished power, to the organizing force. Hence the manifestations of this force is then irregular and imperfect. Neither the nutritive nor the effete elements undergo normal mutations. Secretion is increased in the capillaries of some of the glands, decreased in those of others, and perverted in all.

Animal heat is produced by the normal molecular changes the elements of the blood undergo in the capillaries of the organism. It is generated as much by the food we eat and the fluids we drink, as by the oxygen we inspire. It is not developed by a simple chemical combination of the carbon of the food and of the oxygen of the atmosphere. To generate and develop animal heat is one of the series of the processes of nutrition; unless all these processes are normal, the quantity of heat cannot therefore be normal.

When lesion of nutrition and secretion exists in all the tissues, the cellular changes of the nutritive and effete elements are not performed with normal regularity and in normal quantity; because the oxygen of the atmosphere, absorbed by the glands in the pulmonic and cutaneous capillaries, is acted upon by the organizing force in some of the capillaries only; while, in others, it is not consumed by molecular combination, but remains, in a great degree, free to combine, not only with the abnormal elements of the blood, but also with the protein elements of the solid tissues. The consuming force of the free oxygen, acting upon the organizing force of the solid tissues, produces in those tissues, to which branches of the sensitive nervous system are distri-

buted, the sensation of *heat*, or *burning* and *pain;* in those to which excito-motory branches are distributed it causes *irregular* and *involuntary* muscular action; and in the blood, which has no other nervous endowment except that of the automatic, it augments the lesion between the elements of the blood, produces the sensation of *thirst*, facilitates the formation of congestion and inflammation, and accelerates the molecular changes of the different forms of the automatic nervous force into that of the chemical.

When the different forms of the chemical force, which is an abnormal manifestation of the automatic, are extended to the sensitive and excito-motory tissues, a *shivering* or *chill* is developed; manifestations of augmented and perverted sensation and irregular and involuntary muscular motions transpire; a lesion of circulation in the external capillaries exists; the blood is neither normally attracted nor normally received in these vessels; the muscular action of the heart and arteries becomes tumultuous; an abnormal quantity of blood accumulates in the thoracic and abdominal venous systems.

The molecular changes of the normal automatic nervous force of the external capillaries consumes by cellular combination the excess of the chemical force between the elements of the diminished quantity of blood remaining in these vessels; the sensation of warmth is restored; muscular action is tranquillized; the blood, greatly contaminated by the retained effete elements of the food and of the transformed tissues, begins to return in increased quantity to the external capillaries, whose normal organizing force consumes, in some degree, the different forms of the chemical force between the elementary constituents of the blood; removes a quantity of the effete elements by secretion, and conveys the blood, thus partially depurated, into the venous branches, by which it is returned to the heart. The mechanical force of the muscular action of the heart propels the blood into the arteries, in which it undergoes a continued series of molecular changes till it is conveyed into the capillaries, in which a different and an augmented cellular mutation transpires, a quantity of effete elements are removed by secretion, and the blood again conducted into the venous branches.

When the organizing force of the automatic nervous system is superior in intensity to that of the different forms of the chemical, each time the blood is conveyed through any of the great depurating glandular systems a quantity of its effete elements are removed by secretion; but when the organizing force is inferior in intensity to that of the chemical, the blood becomes more and more contaminated by the effete elements of the transformed tissues of the organism, until the organizing force is consumed by the molecular changes of the multiplied forms of the chemical, and life is extinguished.

The depuratory glands maintain a complementary relation of function with each other; and it seldom occurs that the functions of all are alike diseased. When the lungs, the liver, or the kidneys are congested, the skin is always anæmic; when inflammation, which is excessive and perverted nutrition, exists in any of these glands, the external tissues are always more or less

bloodless, according to the duration and degree of that diseased condition and the causes by which it is produced; and when the external capillaries are congested, or when they are the seat of excessive and perverted nutrition, the circulation in the other depuratory glands, especially the liver and the kidneys, are proportionally disturbed. From the anatomical structure of the portal venous system, the capillaries of the liver and the kidneys are more liable to congestion than those of the lungs, when a recession of blood takes place from the external capillaries; because the veins in this system, like those in the lungs, are without valves, but of larger size, and in a position more favourable for the reception and lodgement of blood by its retrograde movement from the right side of the heart. When lesion of circulation exists in the external capillaries, a reflux of blood into the portal system always occurs in a proportion of direct equivalence to the degree of this lesion.

Either a determination of blood or a congestion in the hepatic, the renal, or the intestinal capillaries, may be produced according to the duration, repetition and intensity of the disturbing cause and the degree of resistance offered by the organism.

When the blood is determined to the liver by recession from the external capillaries, retaining effete elements which should have been removed by the depuratory glands of the skin, the presence of an increased quantity of abnormal blood in the hepatic capillaries is always evinced by the secretion of an augmented quantity of *bile*, which is often perverted in quality.

Congestion of the liver exists, when the molecular changes of the blood in the hepatic capillaries is, in a great degree, controlled by the superior intensity of the chemical force. The secretion of bile is then always greatly decreased, until the automatic nervous force of the capillaries is almost wholly transmuted into chemical, when the biliary secretion is largely augmented in quantity, but altered and perverted in quality. These conditions of the biliary secretion have often been observed in this climate, when the days are hot and the nights cool, in alluvion districts abounding in stagnant water; and in a more southern climate, when the dew-point is high, a perverted state of the biliary compound is always present during fever.

Lesion of the external capillary circulation must always take place *before* a determination of blood to the liver and kidneys, or a congestion in these glands, can occur. The blood must recede from the external capillaries into the portal system, and its retention there must be favoured by the imperfect introduction of the blood from the arterial branches into these vessels; because, when the blood is normally admitted into them, the equilibrium of the circulation is soon restored, and the abnormal accumulation of the blood in the portal system ceases to exist.

A *bilious* derangement cannot, therefore, be produced without a *previous* lesion of the circulation in the external capillaries. All the tissues are formed by the organizing force of the automatic nervous system out of the organizable material of the maternal blood during embryotic life; and, after birth, they

are nourished and sustained, decomposed and removed by the varied and different forms of this force. Cells are the agents which it employs to perform all its functions in the organism. Throughout every tissue they obey the mandates of this force. Hence what they do, whether normal or abnormal, indicates the *state* of this force in its multiplied forms. Their physiological productions and pathological manifestations should, therefore, be attentively observed and assiduously studied.

When the organizing force is diminished in quantity and weakened in intensity in the external capillaries by a recession of blood from these vessels to the venous system of the thorax and abdomen, caused by electrical disturbance in the atmosphere, and by the retention of the effete elements of the food and of the transformed tissues, it is of the first importance to determine, with some degree of confidence and certainty, the compensatory assistance which its vast multiplicity of forms in other tissues will lend to restore it to a normal condition in these vessels. They are all endowments of the organism; all they do is for its conservation; but what can they do now?

The blood is diseased by a lesion of the organizing force between its elements; many of its cells neither grow nor mature; they contain organizable constituents; these are not organized normally by normal forms of the organizing force; but abnormally, by perverted forms of this force; they aggregate and constitute either congestion or inflammation, or both, in the great depuratory glands. There is a lesion of nutrition; the supply of nutritive material is proportionally diminished; only a small number of new recruits are mustered into the service of the organism; these have not been trained to obey the commands of the organizing force; they too often desert and seek association among the tumultuous host governed by chemical force. There is not a sufficient quantity of normal cells which undergo normal molecular changes to maintain a perfect equilibrium between the processes of waste and repair. Their quantity must be increased. How can this be done? Not by the introduction of nutritive elements; but by the depuration of those which already exist among the other elements of the blood. This can only be accomplished by molecular changes of these elements, by which the effete are elaborated and separated from the nutritive.

The diminished quantity of the organizing force in the external capillaries, caused by recession of blood from these vessels into the portal venous system chiefly, the superior intensity of the chemical force in the blood, thus accumulated in this system in augmented quantity but perverted quality, and the consuming force of the imperfectly combined oxygen of the atmosphere, introduced into the blood at each inspiration, resist the fulfilment of this restorative indication. The imperfectly combined oxygen is not only consuming, by molecular combination, the nutritive elements of the blood, but also the solid tissues.

A complete lesion of nutrition is soon produced; the chemical force, in its multiplied forms, rapidly augments in intensity by superior quantity; the

sensations of *thirst* and of *increased heat* are urgent and agonizing; *pain* is felt; oxygen is consuming the sensitive nervous branches.

The *first* indication to be fulfilled is the *removal* of this *oxygen*. This must be done by molecular combination.

As vacuity always favours absorption and repletion retards it; and as the external capillaries are comparatively in the former condition, while the hepatic and renal capillaries are strictly in the latter, it follows that absorption would take place with much more celerity in the former. When this abnormal state of the circulation is associated with the physiological fact, that the different forms of the automatic nervous force maintain and control the elements of the blood in the external capillaries, while pathology as plainly indicates that those of the chemical predominate more or less over these elements in the visceral capillaries, a comprehensive appreciation of the varied functions of the organism and of the compensatory assistance they afford each other, most conclusively show, that curative means should be addressed to the external capillaries commensurate with their depurative and compensatory functions.

This proposition is supported by the anatomy and physiology of the cutaneous tissues as well as their physiological relation of function and pathological compensatory assistance. We have abundant evidence that the sensitive and excito-motory nervous branches are largely distributed to the tissues, through which the external capillaries are ramified, by which these nervous branches are supplied with nourishment, and receive the disturbing impression of the chemical force; that the tissues to which the visceral capillaries are distributed have no sensitive and excito-motory endowments; that the sensitive nervous system is the agent the automatic employs to bring the organism into relation with the external world; that the excito-motory is the agent it uses to protect the organism from external objects; and that these two nervous systems often lend a compensatory aid to the automatic. Their restoration and conservation should, therefore, always be a primary object.

The existence of imperfectly combined oxygen in the external capillaries will, for this physiological reason, be instantly evinced by the sensation of pain and increased heat of the skin and the manifestation of involuntary muscular motions, while a proportionate quantity of uncombined oxygen in the visceral capillaries, which have not these nervous endowments, would only excite the sensation of *thirst and oppression*. The imperfectly combined oxygen should, therefore, be consumed by molecular combination in the external capillaries and be removed by secretion, so that the sensitive and excito-motory systems would be in a condition to lend compensatory assistance to the automatic in the depuration of the blood in the other depuratory glands. How can the removal of the imperfectly combined oxygen of the atmosphere in the external capillaries be accomplished? By the *use* of *water*. Its temperature and its mode of application must be governed by the state of the different forms of the automatic nervous force. This is indicated by the augmented or diminished quantity of blood in the external capillaries; by the tempera-

ture of the skin; by the mechanical force of the muscular action of the heart and arteries; by the state of the venous system, whether congestion exists in any of the great depuratory glands or not; by the decreased and perverted, or the increased and perverted, sensibility of the sensitive nervous system; by the irregular and involuntary muscular motions of the excito-motory system; by the lesion of the nutritive process; and by that of those of secretion.

When warm water is properly applied to the cool skin, a certain quantity of its heat is instantly transmuted into animal electricity. This gives increased intensity to all the forms of the automatic nervous force; the molecular changes of the blood are augmented and accelerated; water is absorbed; the imperfectly combined oxygen in the blood attracts the hydrogen of the water, combines with it, and is secreted in the form of sweat; the oxygen of the water combines with the carbon of the blood, evolves heat, and is secreted in the form of carbonic acid gas. A comfortably soothing sensation reigns supremely through the tissues endowed with sensitive nervous branches. The external capillary circulation is greatly augmented and accelerated; an increased quantity of arterial blood is attracted and introduced into these vessels by the superior intensity of the molecular changes of its elements; the mechanical force of the muscular action of the heart and arteries is stronger and more tranquil; respiration is freer and less hurried; copious sweating ensues; and a large quantity of effete elements are depurated from the blood.

When the skin is hot and dry the water used should be cool. Why? Because there is an abnormal quantity of animal heat and electricity retained in the external capillaries by deficient secretion.

The low temperature of the water increases its capacity for animal heat and electricity, and promotes the affinity of its elements for each other. When it is applied and retained upon the skin, it attracts animal heat and electricity, and causes the secretion of an increased quantity by the cutaneous glands. When the aggregated heat and electricity are thus removed, the different forms of the organizing force assume increased activity; water is absorbed and decomposed; the molecular changes, which then ensue, are the same as those that transpire when warm water is employed.

Sweating may and often does transpire freely without any considerable diminution of the temperature of the skin; because it is only one of the processes of the secretion which takes place in the cutaneous glands. In this state of the skin, the indications for the employment of cool water are nearly the same as when it is hot and dry.

While portal congestion exists, neither the external nor the internal use of water is adequate to the restoration of the functions of the glands, to which this venous system is tributary; because the hepatic, renal, and intestinal capillaries are replete to distension; and only a small portion of this blood passes into the pulmonary circulation in consequence of its retrograde motion from the right side of the heart, or of the enfeebled mechanical force of the muscular action of this organ. The almost complete transmutation of the dif-

ferent forms of the automatic nervous force into those of chemical, by the superior intensity of the augmented quantity of which the molecular changes of the blood in these vessels are governed, causes the absorption and secretion of the hepatic, renal, and intestinal glands to be either greatly decreased in quantity and vastly altered in quality, or largely augmented in amount and wonderfully perverted in elementary arrangement and chemical composition. If, therefore, water be introduced, either by drinking or by injection, into the alimentary canal, it cannot be normally absorbed, nor can it undergo normal molecular changes, because chemical force prevails over the cellular changes which transpire between the elements of the blood and the solid tissues. Water cannot then be normally absorbed, and, if it be abnormally taken into the circulation, it cannot undergo normal molecular changes, constitute an elementary constituent of the blood, and promote secretion; because both absorption and secretion are produced by the cellular formation and coalescence of the elements of the blood; and they always bear a relation of direct equivalence to the increase, decrease, or perversion of these molecular changes.

I have shown that the hepatic, renal, and intestinal capillaries are more or less replete according to the degree of portal congestion; that repletion retards absorption; that the different forms of the chemical force predominate over those of the automatic, when this congestion exists; and that this predominance always decreases and alters, or augments and perverts absorption and secretion in a proportion of equivalence to its degree of prevalence. Hence it is an obvious fallacy to endeavour to restore the normal secretory action of the hepatic, renal, and intestinal glands by the introduction of large quantities of water into the alimentary canal. It is not only erroneous, but often positively injurious, because the mechanical force of distension by an elastic substance like water always favours absorption, while it proportionately retards secretion. The capillaries of these glands are already too much distended by the aggregated blood; why increase their distension by the introduction of water? The blood is so altered in quality, and so perverted in elementary arrangement and chemical composition, that it cannot undergo normal molecular changes. Will not the additional water introduced by abnormal absorption augment the perversion of the cellular mutations between the elements of the blood by the superior intensity of an increased quantity?

The sensation of *thirst* is urgent and agonizing. Will the drinking of copious portion of cold water allay it? The experience of every physician answers that it will not; but, on the contrary, it will do a positive injury so soon as the quantity is sufficient to distend the stomach, and, by the mechanical force of its pressure on the mucous coat, accelerate its absorption, unless it be happily ejected by vomiting, when the sufferer will feel joyously relieved. A few moments' sweet repose will follow, when the sensation of thirst will return, if possible, more agonizing than before. If copious draughts of cold water afford no relief, if it often be a positive injury, what must be done? Do what pathology imperiously demands.

Neutralize, by molecular combination, the imperfectly combined oxygen of the atmosphere in the blood by the proper use of water. How can this be done? Appease the urgent thirst by the use of ice, broken into small pieces and swallowed; and, when ice cannot be obtained, by small quantities of cold water. Ice is more efficacious than water; it is much more slowly absorbed, and seldom or never does injury by distension. Its hydrogen is at first feebly attracted by the imperfectly combined oxygen in the blood; only a small portion is combined and forms a component part of the water of the blood, while its oxygen has a feeble affinity for the carbon of the blood, in consequence of the imperfect elementary arrangement of the molecular combination of the carbon. As but a small quantity of the water of the ice is absorbed and decomposed, its hydrogen neutralizes by combination an equally limited amount of the imperfectly combined oxygen in the blood; and as this oxygen is introduced in ample quantities at each inspiration, it follows that its consumption should be commensurate with the quantity introduced. Hence the necessity for the employment of water externally. The skin presents a surface of about fifteen square feet, and is liberally endowed with absorbent and secretory glands. These have the same tissual endowments as the same kinds of glands in the abdominal and thoracic organs, and associated in intimate structural arrangement are sensitive and excito-motory nervous branches. As pile upon pile increases the intensity of the electric current, so endowment upon endowment augments the resistance of any particular class of tissues to the force of a disturbing cause.

The *mode* in which water should be employed when the design is to remove imperfectly combined oxygen from the blood, is plainly indicated by the anatomy and physiology of the skin. The cuticle is of firm structure, and in a greater or less degree covered by an unctuous secretion, which resists the introduction of water by absorption; and, although it is penetrated by a vast multitude of openings or pores, yet these are oblique, and often filled by the unctuous secretion, commingled with other secretions and dust so as to resist the admission of water.

Physiology teaches that cells are the agents the automatic nervous force employs to produce molecular changes in the blood; that they generate and develop, control and distribute animal heat and electricity; that a tissue is a good or a bad conductor of these forms of matter according to the facility and rapidity with which this force can produce molecular changes; and that the capacity of every tissue for the generation, development, and distribution of animal heat and electricity always bears a relation of equivalence to the quantity and the degree of rapidity which the cellular changes of its nutritive materials may transpire. Hence the fluids and the soft solids produce more of these forms of force or matter, and are better conductors of them than the skin.

When it is designed to relieve the blood in the external capillaries from aggregated heat and electricity, and imperfectly combined oxygen, it is there-

fore necessary that the molecular changes should be augmented among the elements of the blood, and that a conducting medium should be applied and retained upon the skin for some time, that the requisite molecular mutations may be produced in the cutaneous capillaries, and that the product of these changes may be conveyed to the surface of the skin. Water is the best medium for this purpose, because the imperfectly combined oxygen in the blood has a strong affinity for its hydrogen, while its oxygen has an equally strong affinity for the carbon of the blood. These reciprocal affinities accelerate the molecular changes of the elements of the blood, and thereby promote the absorption and molecular combination of the water.

These molecular changes elaborate and arrange a portion of animal heat and electricity, imperfectly combined oxygen, and some of the other effete elements of the blood into the form of the secretory compounds of the skin, and cause their removal to the surface, upon which the animal heat and electricity are transmuted into mechanical force, by which sweat or any other fluid is thrown off from the skin in the form of vapour. Authors teach that animal heat is absorbed by the sweat or other fluids on the skin, and becomes *latent.* This is a fallacy. There is no such thing as *latent heat.* If a new form of force is not developed when animal heat and electricity are conveyed to the surface of the skin, what causes sweat, or any other fluid, to assume the form of vapour? Nothing but mechanical force can, in this manner, change the form of water. If this force be not developed by the conversion of heat and electricity into mechanical force, how is it obtained? For a more extended consideration of this interesting subject, read an article I contributed in the July number for 1855 of the *American Journal of Medical Sciences,* in which I maintain the *unity* and *mutual convertibility* of all the different forms of force or matter.

When it is designed to promote either the secretion of animal heat and electricity from the external capillaries, or when it is desired to communicate them to the different forms of the automatic nervous force in these vessels, water is, therefore, the best medium; and it should be applied and retained upon the skin for some time, because of the anatomical structure and physiological functions which transpire in the cutaneous capillaries. This can be done by means of folded sheets of domestic or linen, neatly and closely rolled around the person, wet in warm or cold water according to the indications to be fulfilled. Dry sheets should be carefully passed around the wet ones for the purpose of keeping the bedding dry. The atmospheric oxygen should be carefully excluded; for when this has free access to the skin, it disturbs and often prevents the reciprocal affinities of the different elements for each other, and thereby arrests or retards molecular changes among the elements of the blood. This is also the most favourable mode of applying water to the skin to promote its absorption; for it is retained upon the skin, and a slight degree of pressure always favours absorption.

When pulmonary or portal congestion exists, especially when unattended

by inflammation, the domestic or linen should be carefully enveloped by a woollen blanket, which is a very imperfect conductor. This would, in a great degree, exclude the oxygen of the atmosphere, retain the heat secreted from the external capillaries, resist its conversion into mechanical force, support the different forms of the automatic nervous force, favour the intensity of the molecular changes of the blood, and thereby promote the secretion of an augmented quantity of its effete elements by the depuratory glands of the skin.

The *local use* of water often contributes greatly to the comfort of the patient, and assists essentially in the fulfilment of important indications of cure by consuming the imperfectly combined oxygen, by which the sensitive nervous branches are soothed; the excito-motory, tranquillized; and the automatic, invigorated. During fever, especially when the skin is hot and dry, three or four folds of linen, wet in cold water and laid upon the forehead, often confers a boon of relief from agonizing pain and burning heat, and thereby contributes essentially to restoring the diseased transformation of the tissues to a normal state by eliciting the compensatory assistance of the sensitive and excito-motory nervous systems. Relieved of the excess of the imperfectly combined oxygen locally manifested by the sensation of pain and burning heat in the external capillaries of the head, these nervous systems impart increased intensity to the different forms of the automatic, augment and accelerate the molecular changes of the blood, and promote the secretion of additional quantities of the effete elements of the blood by the depuratory glands. Congestion of the brain is often only *simulative*, not *actual*. This state of the brain is often observed; and I apprehend it is frequently mistaken in our *Western* alluvion districts, in which individuals are exposed to all the atmospheric vicissitudes incident to a climate, whose physical geography is chiefly composed of rich alluvial soil, clothed in forest trees and vegetation luxuriating in gorgeously exuberant foliage, variegated by winding and often sluggish streams, stagnant bayous, and deep, silent lagoons, which, in the summer and a part of the autumn, are exposed to a high temperature during the day and a low temperature during the night, causing the atmosphere to be more or less loaded with *warm moisture* during the former period, and a *cool, dense vapour* during the latter.

The alluvion districts are irregularly girdled by undulating highlands of clay soil underlaid by limestone. During August and September, these highlands are often dry and parched; the atmosphere is hot and *dusty;* vegetation languishes; foliage fades; the earth glows; the horizon gleams; forest and fields seem a desolate waste. Pass upon the alluvion lands; mark the contrast. The atmosphere is soft and moist; vegetation smiles in exuberance; foliage is robed in deep green attire; forest and fields seem to revel in gay festivity. Evening approaches; darkness mantles the sky; a cool, dense mist-vapour pervades the atmosphere. This physical condition of the atmosphere disturbs the normal relation between the different forms of the automatic nervous force; lesion of nutrition and secretion is produced; lesion of

capillary circulation follows; diseased transformation of all the tissues supervenes; the blood is not normally introduced into the external capillaries from the arterial branches by the molecular changes of nutritive attraction; it aggregates in the portal venous system, in which the varied forms of the transmuted automatic nervous force prevail over the molecular changes of the blood, produce diseased transformations of its elements, and cause their rearrangement, coalescence, and chemical composition in accordance with the laws of chemical combination.

Every attribute of the brain and spinal marrow are created perpetuate, and impaired or destroyed by the molecular changes of the blood produced by the different forms of the automatic nervous force. Hence the functions they perform in the human organism always sustain an intimate relation of dependence on the state of this force in its varied forms. When portal congestion exists, and the different forms of the automatic nervous force are largely transmuted into those of chemical, the molecular changes of the blood in the arterial, venous, and capillary systems are imperfect. These vascular systems in the brain and spinal marrow constitute no exception. The molecular changes of the blood in them partake of the imperfection. Hence the attributes of the brain manifest every degree of lesion from greatly augmented and perverted sensibility to its complete suspension. As the molecular changes of the blood become more and more diseased, the attributes of the brain are more and more perverted, until sensibility becomes very obtuse or entirely suspended.

This condition has often been mistaken for that of congestion. Why? Because of the stupor and insensibility? These are symptoms usually present in both conditions of the cerebral vascular systems. A careful investigation of all the symptoms, and a proper appreciation of the pathological conditions which produce them, will reveal the diagnostic symptoms which indicate the existence of congestion of the brain, and those which evince that of an extreme perversion of the elements of the blood in the cerebral tissues. It is of the first importance to ascertain conclusively, which of these conditions is present; because some of the most potent agents in the treatment of the one would be positively injurious in that of the other. How essential that the diagnosis should be correct. Life depends upon it. The danger of the patient is imminent. The most active means must be employed. Three or four folds of linen or domestic wet in warm water should be applied over the whole length of the spine. The legs and arms should also be enveloped in the same. The linen or domestic should be frequently wet, that its temperature may always remain as high as the patient can endure. Copious injections of warm water should also be given every hour or two, and calomel and opium administered every two or three hours. The necessity for continuing the use of water, as it is here directed for a considerable period, is manifest, when we contemplate the cause of this pathological condition, the

mode in which it was produced, and the means by which the different forms of the automatic nervous force may be restored to a normal condition.

In the April No. of this Journal for 1856, I have discussed the causes of fever at considerable length; and in this paper I have endeavoured to explain the mode in which these causes influence the human organism; what curative indications may be fulfilled by the general use of water applied upon the skin; the futility of drinking copious draughts of water to promote the secretory depuration of the blood; but the vast importance of the subject will require a further consideration of its curative agency, when locally employed.

Pathology teaches that the sensitive and excito-motory nervous systems often lend a compensatory aid to the automatic; and that without them the latter could not maintain all the attributes of the human organism; for although the automatic elaborates and appropriates the material to sustain and perpetuate these; yet it must employ one of them as an agent to bring it into relation with the external world, and the other for the production of muscular motion. The automatic supplies the *creative, sensitive,* and *motive* power; the sensitive and excito-motory are endowments which it employs for the manifestation of the higher and nobler attributes of intellectual beings. Hence all these nervous systems maintain a relation of mutual dependence on each other. They all perform functions indispensable to the conservation of the human organism. The imperative necessity for eliciting the reciprocal aid of these nervous systems in simulative congestion of the brain is, therefore, obviously manifest. How can this be best accomplished?

The automatic nervous system is endowed with the creative and distinctive agencies of the organism. These are no longer equal to each other; the destructive predominates. How can this predominance be subverted? The molecular changes of the blood are not normal. The blood is becoming more and more contaminated by effete elements. Normal nutritive elements cannot be introduced. Those which exist must be depurated. The depurative glands of the skin and lungs have sensitive and excito-motory nervous branches in intimate relation with them, while those of the liver and kidneys are without those efficient endowments which always give increased intensity to the different forms of the automatic nervous force. This combination of nervous endowments, which are ever ready to compensate for the deficient functions of each other, bestows upon the tissues to which they are distributed a much more durable resistance to the force of a disturbing cause than that possessed by those which are endowed with automatic nervous branches only.

The anatomical relation which the pulmonary and cutaneous vascular systems sustain to the portal venous system, always causes them to contain less than a normal quantity of blood, where, from any cause, an accumulation of blood takes place in this venous system. The blood in the cutaneous blood-vessels is nearer maturity than that in the internal organs; for, in these it is in every state, from incipiency to maturity; while, in the former, the mass

approaches maturity; and, as a consequence of this, the different forms of the automatic nervous force in the external bloodvessels offers greater resistance to the force of a disturbing cause. From the superior nervous endowments of the external tissues; from the anatomical relation of the external bloodvessels to those in the internal organs, and from the diminished quantity and approaching maturity of the blood in them, the external tissues do not generally suffer as much by a disturbance of the different forms of the automatic nervous force as those of the internal organs. The state of the blood in the external bloodvessels; the intimate relation of the cutaneous depurative glands with sensitive and excito-motory nervous branches; the compensatory relation of functions between the different nervous systems; and the immense expanse of the skin, conspire to make this the most fertile and productive field in which remedial agents can be employed.

Why has it been so much neglected? Because remedial means have not been so used as to elicit the curative agencies of the component tissues of the skin.

Bathing was employed in the earliest ages of antiquity, and it has ever continued to be held in high estimation among many nations. But the proper employment of water as a remedial agent has not sufficiently engaged the attention of the medical profession. Bathing is conducive to cleanliness, and elicits, in some degree, the compensatory aid of the sensitive and excito-motory nervous functions. But the depuration of the blood, when there is any considerable disturbance of the different forms of the automatic nervous force among its elements, requires the continued application of water for a certain period, so as to influence the molecular changes of its elements, promote their formation, accelerate their rearrangement, augment their coalescence, and favour their separation into nutritive and effete elements.

This evinces the necessity for the continued application of water along the course of the spine, when the design is to elicit the compensatory aid of the sensitive and excito-motory nervous branches in the depuration of the blood, when there is extreme perversion of its elements. For the skin over the spine is largely endowed with these nervous branches in a comparatively favourable condition to lend their assistance; the external tissues are more liberally endowed with means of resistance to the force of a disturbing cause than the internal organs; the blood in them, although diminished in quantity, is nearer maturity than in these organs; the different forms of the automatic nervous force in the external tissues, therefore, soon manifest increased intensity when water is applied and retained upon the skin.

The molecular changes of the blood in the minute capillaries about the origin of the excito-motory nerves, and that of the sensitive nerves which arise from the medulla oblongata, are increased in intensity, augmented in quantity, and altered in quality; the elements of the blood are formed and transformed, coalesced and rearranged with multiplied celerity; the nervous roots and adjacent tissues are supplied with additional quantities of nutritive

material; more powerful reflexed actions are transmitted; the compensatory aid of these nervous systems begins to be manifested. Now apply a folded napkin, wet in hot water, over the epigastric region; inspiration is freer; an increased quantity of oxygen is absorbed, and an additional quantity of carbon is secreted by the augmented molecular changes of the blood in the pulmonic capillaries. The mechanical force of the muscular action of the heart and arteries soon receives increased power from the altered quality of blood conveyed to their muscular tissue by their nutritive arteries, and an augmented quantity of blood is propelled and conducted to the external capillaries, in which the different forms of the automatic nervous force have received increased intensity by reflexed action. This intensity may be greatly augmented, and the reflexed action made much more conducive to its integrity by enveloping the arms and legs in three or four double of linen or domestic, wet in hot water, and retained for at least half an hour; because the imperfectly combined oxygen of the atmosphere, conducted along with the blood into the external capillaries, would then attract the hydrogen of the water, combine with it, and constitute water, which would be removed and deposited on the skin in the form of sweat; while the carbon of the blood would combine with the oxygen of the water, evolve heat, and be removed in the form of carbonic acid gas. Freed of the consuming force of the imperfectly combined oxygen, the sensation of pain and burning would not be experienced; the compensatory force of reflexed action would be more manifest, because it would be consumed chiefly by imparting increased intensity to that of the different forms of the automatic, and not by the manifestation of perverted sensation and involuntary muscular motions. It would, therefore, contribute to the molecular changes of the blood, and accelerate its depuration in the external capillaries by favouring absorption and promoting secretion. When we review the immense extent of the skin, when we contemplate the magnitude and wisdom of its endowments, we can appreciate the advantages of its agency in the restoration of the organism, when the varied forms of the automatic nervous force are disturbed and ready to invite the oxygen of the atmosphere into the citadel of life. The arms and legs may be constituted into four fields for the subjection of the rebellious elements of the blood; the commanding officer must be selected and nurtured in the cerebro-spinal region; while new recruits must be trained and mustered into the service of the organism along the course of the alimentary canal.

Copious injections of water should never be omitted in the treatment of fever, as it prevails in the southwest; because there is always more or less biliary derangement; and there is no more efficacious means for the removal of bile and other perverted secretions from the alimentary canal. When the functions of the stomach are so perverted that it will not retain medicine, copious injections of water often have a very salutary effect by removing the altered secretions and other fecal matter from the bowels, by which they promote the tranquillization of the disturbed reflexed actions of the sensitive

and excito-motory nervous systems. This state of the stomach often constitutes a most troublesome complication in the treatment of fever. It is frequently observed in persons who suffer of fever during the hot days of August and September. Copious injections of warm water should be frequently employed; a towel, wet in cold water, should be folded and laid over the entire epigastric region; three or four folds of domestic or linen about six inches in width, wet in cold water, should also be applied over the whole length of the spine and retained for an hour or two; a folded napkin, wet in cold water, may often be advantageously applied over the larynx, especially when the vomiting is persistent. The application of water, in this manner, is of peculiar advantage in controlling the persistent vomiting of children during the period of dentition, because of its efficacious influence in tranquillizing the reflexed actions which the evolution of teeth so greatly augments. Both the colliquative diarrhœa and the persistent vomiting which so frequently afflict children during this tender period are chiefly dependent upon, and often are perpetuated by, this perverted nervous action.

Unless the individual is of intemperate habits the use of water, as here directed, seldom fails to tranquillize the stomach, remove the perverted secretions from the bowels, and prepare the organism for the favourable reception of other remedial agents.

Dr. Henry F. Campbell, of Augusta, Ga., has published two very able and interesting essays on the pathology of reflexed nervous actions during dentition and during fever, with certain complications. These are invaluable contributions to medical science, and they will serve as beacon lights to every pathologist (*South. Med. Journ.*, for June, 1850, and *Trans. Amer. Med. Ass.*, for 1853.)

After the bowels are freely moved and the stomach nearly tranquillized, great advantage may often be derived by enveloping the patient in sheets wet in cold water. Dry sheets should be rolled neatly around the wet ones, and the whole allowed to remain until the sensation of heat and pain is removed. From half an hour to an hour will generally be sufficient to produce this effect. The prompt and judicious administration of quinine will generally prevent the recurrence of these symptoms. During the forming state of fever, and often during the first day or two of its progress, obstinate constipation is frequently observed. For the removal of this complication large injections of warm water are peculiarly efficacious, because they neither offend the stomach nor delay the administration of other appropriate agents. They promote the dejection of the accumulated fecal mass and depraved secretions, and contribute to the normal restoration of the perverted nervous functions.

Diarrhœa is a very troublesome complication of fever, because it greatly promotes the debility consequent upon the fever, causes nutritive material to be voided before it is assimilated, and renders remedial agents much less efficacious. It is often present during the progress of a fever; but it is much more frequently observed during the protracted continuance of a fever as it prevails

in our alluvion river bottoms, with a vast multiplicity of complications. No remedial agent is more efficacious in the removal of the cause of this diarrhœa than large injections of cold water. These should generally be employed twice or three times a day; but they may often be advantageously used after each evacuation of the bowels. The long continued recession of the blood from the external capillaries and its persistent lodgement in the portal venous system, contribute to the perversion of the functions of the vast multitude of absorbent and secretory glands along the course of the alimentary canal, because of its accumulated quantity and altered quality in the intestinal capillaries; while the augmented amount and perverted quality of the biliary secretion is conveyed to the organizing force of many of these glands; but this force is so diminished in intensity by the altered quality of the blood in these glandular capillaries, that when the perverted biliary secretion approaches the glands its nascent formative condition is transmuted, and the constituents of the food, which it was forming into elements of blood, are attracted, combined, and dejected with this altered and perverted fecal compound. This constitutes what is commonly called *irritation* of the mucous membrane of the bowels.

When we see the vast number of absorbent and secretory glands in the mucous membrane of the alimentary canal; when we contemplate the important and multiplied functions they perform for the conservation of the organism, we can easily appreciate the immense advantages of their constant and careful protection, and of their earliest possible relief when disturbed in functional duty.

In the treatment of this complication of fever I greatly prefer cold water injections to all the much commended astringents, because they seldom favour the production of other and often more dangerous complications, as some astringents frequently do; and they promote the establishment of a state of the organism favourable to the administration of quinine and other necessary remedial agents.

Bathing is often a valuable therapeutic agent to harmonize the relation between the nervous systems when no considerable degree of diseased transformation of the tissues exists. It may, therefore, be often advantageously employed in the forming state of fever, or during the convalescence of a patient.

FISKE FUND PRIZE ESSAY.

ART. IX.—*Does Pregnancy accelerate or retard the Development of Tubercles of the Lungs in persons predisposed to this Disease?* By EDWARD WARREN, M. D., of Edenton, North Carolina. The Dissertation to which the Fiske Fund Prize was awarded, June 4, 1856.[1] (Published by request of the Rhode Island Medical Society.)

CHAP. I. § 1.—"Similia, similibus curantur," is the maxim of Hahnemann and his followers. "Contraria contrariis curantur" is the doctrine of Hippocrates and of those who recognize him as their leader. According to the teachings of one, two affections of a like nature cannot exist at the same time in the organism; and the most effectual method of destroying a *spontaneous* morbid condition, is to superinduce an *artificial* state of a similar character. The other affirms, that dissimilar conditions only are incompatible, and that disease is relieved most completely and certainly by developing in the system a state opposite and antagonistic to that already existing. Homœopathy bases its theories upon the doctrine of "similitudes:" Allopathy finds the "fons et origo" of its principles in the great law of "antagonism" which is impressed on all morbid phenomena.

If the utter falsity of this doctrine of "similitudes" were not acknowledged by a vast majority of scientific men, whose daily experience but confirms their logical deductions respecting its real character, it might be important, in this connection, to adduce the testimony of the ablest advocates of Homœopathy in proof of the impracticability of the system, and to demonstrate the contradictions and inconsistencies of its fundamental principles.

But these false doctrines have already reached the climax of their glory; the world begins to realize that it has been deluded long enough by the maxims of this mistaken philosophy; the period for discussion has gone by, and it is only necessary to make a plain statement of the whole matter, and then to leave it to the common sense of mankind, in order to secure the complete overthrow of this pernicious system.

At Leipsic, which has been the head-quarters of Homœopathy, the only hospital devoted to that system contains but six beds, and all of these are

[1] The Trustees of the Fiske Fund, at the annual meeting of the Rhode Island Medical Society, held at Providence, June 4, 1856, announced that they had awarded to the author of the dissertation bearing the motto—

"*Qui fugit molam, farinam non invenit,*"

The premium of one hundred dollars, by them offered for the best dissertation on the following subject, viz: "*Does Pregnancy accelerate or retard the Development of Tubercles of the Lungs in persons predisposed to this Disease?*"

Upon breaking the seal of the accompanying packet, they ascertained its author to be Edward Warren, M. D., of Edenton, North Carolina.

ARIEL BALLOU, M. D., Woonsocket,
HIRAM CLEVELAND, M. D., North Providence,
ISAAC KAY, M. D., Providence,
Trustees.

J. AUG. ARNOLD, M. D., Providence,
Secretary of the Fiske Fund Trustees.

not usually occupied. In Paris, M. Andral put it to the test of experience in one of the general hospitals, and the result was a total failure. He treated one hundred and forty patients in the presence of the homœopathists themselves, adopting every requisite care and precaution, and yet in not one instance was he successful. In Russia, the Grand Duke Michael invested a German homœopathist with full powers to test its merits, and in two months the experiment was pronounced unsatisfactory by the government, and discontinued. In Naples, a trial was made by the royal order, by which it was established, not only that homœopathic treatment produced no effect on disease, but that it was positively injurious—for the reason, that it prevented the employment of remedies by which the patients might have been cured. In London, there are, at present, but two homœopathic hospitals, one of which is about closing for want of funds, and the other is in a declining state. Thus has the system of Hahnemann proved a failure when tested practically, and is now everywhere on the decline.

Theoretically, it has not been more successful, as must be admitted by every unprejudiced mind. The homœopathists have failed to demonstrate either that medicinal powers do produce an artificial malady, similar to the natural affection; that the organism only remains under the influence of the medicinal disease; that the artificial disease is of short duration, or that all the effects can only be produced by selecting an agent which produces results similar to the symptoms; and hence, their doctrines have not only been impugned by Rau, Shroen, and Griesselich, but repudiated as illogical and visionary by the most intelligent observers throughout the world.

The doctrine of Hippocrates has its foundation in reason—embodies the plain, practical, and logical view of the subject, and is sustained by the experience of a vast majority of the most scientific men in every country. Upon it has been reared the superstructure of modern medicine; and to it belongs the glory of nearly all the triumphs which have marked the progress of the healing art from the days of its founder, down to the present time. The principle, that "like causes produce like effects," and the proposition which stands in correlation to it, are recognized in every department of science, and by all classes of observers. So universal is the acceptation of the truths thus imbodied, that they have become axioms in themselves, and the tests whereby the merits of any system may be determined. Homœopathy rejects these propositions—repudiates the principles involved in them, and assumes that Nature, in her therapeutical operations, acts upon another and an entirely contradictory plan. Their explanations of the great processes now under consideration, would lead them, if strictly adhered to in the practice of medicine, to increase the congestion of the brain in apoplexy; to accelerate the circulation in fever; to restrain hepatic action in torpor of the liver; and to induce a condition of debility, stagnation, and impoverishment in the systems of those predisposed to phthisis—which would be as reasonable as for the sailor to attempt to lighten his ship by adding to her cargo, or for the engineer to relieve the strain upon the boiler of his engine, by the constant generation of steam. This system, to be true, must make the axioms alluded to, false; and as the idea of falsity is utterly precluded by the *very definition of the term*, it follows that homœopathy is illogical in its fundamental principles. Disease can be nothing more than a manifestation of certain phenomena, which depend upon the existence of some principle, different in its essence and operation from that agency by which the organism is maintained in its normal state. It consists in the presence of a series of effects, which are the results of the action of a particular cause. This *cause* operates, and

these *effects* are produced in consequence of some alteration of the natural condition of the system, whereby a state is developed favorable to the action of the one, and the manifestation of the other. Hence, we have three elements essential to disease:—

1. An *altered condition*, resulting from the operation of some *general influence* or *cause*, unlike the *normal* or *healthy condition* and favorable to the action of a *particular cause*.

2. A cause distinct alike in its intrinsic character, and in its ultimate effects, and operating in a peculiar manner.

3. Effects, or symptoms, which take their character from the peculiar agent which has called them into existence, and from the manner of its action.

In some affections, as those which are contagious and infectious, this *general* and this *immediate cause* are combined, or so intimately associated, that they cannot be distinguished; whilst in the remainder, such as typhoid fever, phthisis, &c., they are not only separated, but easily recognized and cognizable. Now, it is manifest that the first step towards recovery, consists in an alteration of that original morbid condition, by which the *particular cause* has been enabled to operate in the production of its legitimate effects or symptoms, and hence it becomes a matter of the greatest importance to effect that change promptly and effectually. The continued action of this *particular cause*, or a similar one, implies a continuance of the same *original condition*—whilst the operation of a dissimilar agent, demands the existence of a different state, and demonstrates that it has been superinduced. But effects or symptoms are the only means whereby causes make themselves known, and consequently, it is only when these phenomena are unlike those which presented themselves in the first instance that any positive evidence is afforded of the commencement of the curative process. Thus it becomes evident, not only that the doctrines of Hahnemann are intrinsically false, but that the principles of Hippocrates are logically correct and entirely consistent with the laws of Nature.

Whatever *cause*, then, has a tendency to the production of a certain set of phenomena, is opposed, resisted, or restrained by that agent which produces dissimilar results, and hence the manifestation of these opposite effects or symptoms, is an evidence that an antagonism has been produced and that the curative process is in operation.

Having thus considered the nature of the law of antagonism as enunciated by the oracle of Cos, and demonstrated its logical truth and practical applicability, I shall proceed to examine into the nature of phthisis, for the purpose of showing that pregnancy develops in the system a condition directly antagonistic to that state which favours and accelerates the deposition of tubercles.

This investigation necessarily divides itself into three heads, thus:—

1. A consideration of the tubercular diathesis.
2. An inquiry into the nature of tubercle.
3. An application of the rules respecting disease already established.

Whatever differences of opinion may exist in regard to the real nature of tubercle, all, at the present day, agree that it is preceded by a general morbid condition of a peculiar character. This condition has been denominated "tubercular cachexia," by which is implied the existence of certain abnormal symptoms, indicative of an unhealthy state of the economy, and a predisposition to the deposition of tubercles in the lungs. This diathesis connects itself both with the general system and the organ in which the deposit is made, and hence it is important to examine it in its twofold relations.

1. *As regards the System at Large.*[1]—The ultimate construction of tissues consists in minute cell-formations and cell-germs, which are capable of reproduction so long as they are supplied by the blood with certain organizable materials. In the normal state there is a constant disintegration and reproduction of these cells, and an equable and reciprocal balance between the processes by which they are performed, which constitutes health in the economy. When the supply of pabulum is diminished in quantity or altered in quality, this natural equilibrium is destroyed, and disease results as a necessary and natural consequence. The plasma of the blood is the organizable pabulum which plays this important part in the economy, and hence the circulating fluid becomes the source of formative supply or deficiency to the cell-germs and the means whereby structural degeneration or healthy action is secured. When blood possesses its natural elements in their normal ratio and proper character, the conditions essential to health are complied with, and all morbid action is necessarily precluded. On the other hand, when changes have taken place in the blood, by which its various constituents are reduced below the normal standard, either completely, partially, or in quality, then the function of assimilation is interrupted, and a condition of disease develops itself in the system. The blood is supplied to the body through the agency of nutrition, and when that function is properly performed, the circulating fluid is rich in formative material, the tissues receive their due supply of organizable pabulum, and the normal state of the organism is maintained intact. But if this process is interfered with, the sanguiferous constituents are not produced in their equable and natural relation, the fibrinous plasma ceases to be properly elaborated, the red globules decrease in quantity, the albuminous element becomes excessive, and a condition of disease is developed throughout the economy.

To understand the manner in which the function of nutrition is interfered with, it is necessary to refer to the successive changes which characterize that process under ordinary circumstances. They are the following:—

1. The receipt of organic matter in the stomach.[2]
2. The transformation of this matter into albuminous and oily compounds.
3. The absorption of these by the mucous membrane, and their union into elementary nuclei and cells.
4. The transformation of these, first, into chyle corpuscles, and secondly, into blood.
5. The abstraction of the tissues of these materials which are essential to their nutrition.

Now, it is evident that as all these successive steps are essential to a proper performance of the function of nutrition, an interruption of either will interfere with all those changes which succeed it, and thus derange the whole process. In order to ascertain where the interruption has commenced, when any derangement exists, it is necessary to begin with the last effect produced, and to trace the morbid action through each successive step, until that one has been reached wherein the primary departure from the normal standard originated. In this tubercular diathesis the blood is so altered in quality that it fails to present to the tissues the organizable element which is their pabulum, and hence enervation, emaciation, and derangement of function are the symptoms which characterize this peculiar cachexia. Of all the tissues of the body, that which is composed of fat-globules, and known as the adipose, suffers most, and

[1] See Valentin, Berlin, 1834; also, Wagner, Leipsic, 1839; Shwann, Berlin, 1839; Schleiden, Paget, Meckel, Gairdner, and others.

[2] Dr. Archison, Berlin.

disappears with the greatest rapidity. This fact accounts for the extreme meagreness of phthisical patients, and clearly indicates such a derangement of the function by which fatty elements are produced, as really amounts to its complete suspension. We are thus carried back to that step in the process of nutrition by which chyle is formed, and therein discover certain abnormal changes, which, whether they depend upon any alteration or defect in the chemical and physical actions by which they are preceded, or on some other cause, are amply sufficient in themselves to account for the deterioration of the circulating fluid, and to explain all the phenomena which accompany and distinguish the tubercular cachexia. The experiments of Tiedeman and Magendie, as well as the chemical deductions of Prout and Liebig, clearly demonstrate that a proper admixture of albuminous and oleaginous elements is essential to healthy nutrition; and if healthy chyle be examined, these two principles—fat and albumen—will be found to constitute its essential elements; so that any influence which prevents the existence of either, or the proper admixture of both, impoverishes that fluid itself, and, as a consequence, produces a deterioration of the blood which is formed from it. As the globules of fat cannot enter into the system without being altered, and as an examination of the liquid found in the lacteals discloses the fact that the oleaginous elements have been reduced to a state of infinite division, it becomes evident that this alteration in their character is essential to healthy nutrition, and that there is some organ whose normal function it is to bring fatty materials into this state of emulsion. To M. Bernard belongs the credit of having discovered the manner and means of this transformation. He forced a rabbit to eat nothing but meat, and then, having opened the abdomen, he discovered that the absorbent vessels of the small intestines contained a limpid fluid for the distance of twelve inches below the pylorus, and that from that point they were white, and contained the same fluid as that which is found in the lacteals of the human subject, and in the dog throughout the whole extent of the duodenum. From this fact, and the additional reasons that in man the ducts of the liver and pancreas enter the duodenum together, near the inferior extremity of the stomach, and that in the dog one of the ducts of the latter organ empties with the duct coming from the former, M. Bernard concluded that it was the secretion from the pancreas that made the milky fluid which presented itself in the lacteals, and which depended upon the reduction of fat-globules to a state of emulsion for its peculiar appearance. As a means of testing the truth of this inference, he mixed pure pancreatic juice with oil, butter, tallow, and many different varieties of fat, and ascertained that it formed an emulsion with them all, resembling in every respect the chyle extracted from the mesenteric lacteals, and capable of *retaining its peculiar character for an indefinite period.* He then tried bile, saliva, gastric juice, serum, and the cephalo rachidian fluid, without producing any other effect upon oleaginous matter than the formation of a mechanical mixture, *which returned to its original state* in a few moments. In addition to these external experiments, he made others upon the internal organs, by which his first conclusions are positively substantiated. They are thus described by Dr. Donaldson :[1]—

"After keeping a rabbit fasting for some time, he gave it a full dose of twenty grammes of fat, and, allowing sufficient time for it to be pushed down in the intestine, he killed the animal in three hours, and found the absorbents nearly empty to the point of insertion of the pancreatic duct, whereas below that they were distended with white chyle. In the intestinal canal, above the duct of the pancreas, there was some melted fat which was unaltered in colour, but below

[1] American Journal of the Medical Sciences, 1851.

it was seen white emulsion, corresponding to that contained in the lacteals. His next essay was in tying the pancreatic duct of another animal of the same species before giving the oil, and, on opening the abdomen after the same lapse of time, he found the lacteals free from chyle, and the oily matters undigested in the intestinal tube passing down to be thrown off in the excrement. On putting a ligature around both the pancreatic ducts of a dog, he had the same result."

From the facts thus clearly established, he drew the inevitable conclusion that "the *digestion* of fatty matters was the peculiar office of the pancreas." This deduction has also been substantiated by the observations of Barreswil, Colin, Lassaigne, Dumas, and others, and is now generally received and admitted by the medical profession.

In tubercular cachexia, this digestion of fatty matter is prevented, and hence, the demand upon the tissues for the oleaginous materials deposited in them, and the general emaciation which immediately results to the patient. An interference with that process by which fat is emulsionized and made assimilable, must depend upon some alteration in the pancreatic fluid, or derangement of the organs by which it is secreted. Bennett believes that this result is due to some vitiation of the fluid, and explains the phenomenon in the following manner: "The peculiarity of phthisis however, is, that an excess of *acidity* exists in the alimentary canal, whereby the albuminous constituents of the food are rendered easily soluble, whilst the *alkaline* secretions of the saliva and pancreatic juice are more than neutralized and rendered incapable either of transforming the carbonaceous constituents of vegetable food into oil, or of so preparing fatty matters introduced into the system as will render them easily assimilable." That this *acidity*[1] exists can be easily established, either by appealing to authorities or referring to the experience of every practitioner of medicine, and that it increases the solubility of the albuminous constituents, is perfectly evident; but its effect upon the pancreatic fluid is involved in much doubt and difficulty.

If this development of acid were the first link in the chain of morbid phenomena, nothing would be easier than to counteract it by the employment of appropriate neutralizing remedies. By the use of proper alkaline agents, this condition of acidity—by which the function of the pancreas and the process of healthy nutrition are arrested—could be easily destroyed, and the tubercular diathesis removed without difficulty or delay. It is well known, however, that no morbid state is more obstinate or persistent, than that which is characterized by a disposition to the formation of tubercles in the pulmonary parenchyma, and that the only treatment from which a successful result may be anticipated in this cachexia, consists in the constant employment of appropriate tonics in connection with certain general remedies. This is an important fact, as will be demonstrated in another part of this paper, because it indicates that the source of the disorder can be traced to the nerves, and associated with the vital forces of the economy.

Again—if the improper digestion of oleaginous elements depends upon the alteration effected in the pancreatic fluid, in consequence of the development of this excessive acidity, then the employment of substances rich in acidulous constituents, would predispose to this particular diathesis. An indication would thus present itself in the treatment of phthisical predisposition, which would demand the constant abstinence from those alimentary elements which contain acids, and the avoidance of acids as remedies under every circumstance which connects itself with this particular cachexia. This would involve us in the absurdity of attempting to prevent the invasion of

[1] Clark, Williams, Wood, and others.

phthisis by the development of the circumstances most favourable to the existence of scorbutus, and the rejection of remedies standing pre-eminently forth in the list of *tonics*, which are universally admitted to be most useful agents in the management of the tubercular diathesis. If the above explanation be correct, it would follow as a matter of course, that with those persons who habitually use a large quantity of food, rich in acidulous elements, phthisis would present itself most frequently; and hence, in the tropics, where fruits are constantly ingested, cases of this affection would be most numerous—whilst the very opposite of this is true, as is universally admitted. Emaciation does not necessarily ensue where there is excessive acidity, for Trousseau has long since reported and explained many cases of dyspepsia in which this feature was particularly prominent, whilst the fatty tissues remained intact, and a plethoric condition of the system was maintained. It is well known also that many persons suffer habitually from an inordinate development of acidity, without being materially affected in their general health, and manifesting any waste of tissue or diminution of rotundity.

The idea of the necessity for the preservation of alkalinity in the pancreatic fluid, is not original with Bennett. M. Mialhe[1] maintained that alkalies are the great solvents in the animal system, and that their presence in the secretion of the pancreas, is the cause of the formation of that emulsion, whereby fatty matters are made digestible. M. Bernard, however, has conclusively demonstrated that the explanation is utterly false, and the question of its paternity is consequently rendered an unimportant one. In the first place, he showed that the natural acidity of the mucus would be sufficient to change the reaction of the juice as it issues from the pancreatic duct; and in the second, he proved that the *fluid acts even in the acid mixture*, which of course settles the question immediately and definitely. It follows, then, from these considerations, that the improper digestion of the oleaginous elements of the food does not depend upon an alteration in the pancreatic fluid, after it has been secreted, and that Bennett is entirely mistaken in his explanation of the phenomena. If the fluid be not in fault in this manner, then the pancreas must be the source (intestinal) from whence originate these influences, which so materially interfere with and modify the digestive process. They must either *produce* an altered and unhealthy fluid or secrete the natural one in a diminished and insufficient quantity. Either supposition will account for the condition of things which results in the intestine, and to the system at large, and it is unnecessary in this connection to attempt to determine which explanation is the correct one. It is manifest that there is some defect in the secreting powers of the organ, by which a proper performance of its functions is prevented, and from which all the morbid phenomena originate. This organic difficulty must depend, either upon some local cause, as inflammation, congestion of its substance, or some general one connecting itself with that nervous influence distributed to it, by which its normal actions are directed or controlled. The symptoms which distinguish the operation of the first series of causes, are described by all writers on pathology, and can be easily distinguished by every observer. As these do not exist, and as post-mortem examinations fail to discover those organic lesions which are indicative of inflammation, congestion, &c., it follows necessarily that the derangement in question results from the action of the general cause alluded to above.

The influence of the nervous system on the secreting powers of the various

[1] Mémoire sur la Digestion et l'Assimilation des matières albuminoides, &c., 1847.

organs, has long been maintained by pathologists, but it was reserved for the learned and laborious Bernard to explain and demonstrate it fully. By a series of most ingenious and convincing experiments, he has eliminated the nature of the offices imposed on the various classes of nerves, and showed conclusively, that the trophic system controls and presides over secretion. He traced out the particular nerve distributed to different organs, and succeeded in promoting and arresting the production of the fluids appertaining to each gland, by alternately increasing and diminishing the amount of nervous force with which it is supplied. From these experiments, and on account of the reasons mentioned above, it is fair to conclude, that the improper digestion of oleaginous elements, upon which emaciation depends in the tubercular cachexy, results from the fact, that the normal amount of nervous force is not conveyed to the pancreas; and hence, it is evident that the primary lesion connected with phthisis, is to be found, not in the digestive apparatus itself, but in the nervous system which presides over it. This view of the subject is not only the one which best explains the phenomena characteristic of the tubercular cachexy, but is sustained alike by an examination of the causes which induce this particular diathesis, and a reference to the remedies essential to its relief.

The causes of phthisis may properly be divided into two classes: (1.) General Causes. (2.) Special Causes.

(1.) *General Causes.*—Among the most prominent of these is hereditary predisposition. Since Hippocrates declared "Ex tabido tabidus," all writers, with two exceptions, have repeated, that consumption is hereditary. Louis contends that phthisis is not ordinarily inherited, and Piorry affirms in his second work, that it is only so in one case out of ten. It is no longer believed that the disease transmits itself by means of a particular virus, as was once supposed, but its reproduction is attributed to the development in the child of the same qualities, mental and physical, as those which distinguished its parents. It is evident that a predisposition which depends upon the existence of a *mental quality*, must connect itself with some abnormal condition of the nervous system; since it is only through the medium of the nervous mass, that mind manifests itself in its varied and multitudinous relations. The very fact that phthisis is an hereditary affection, is *prima facie* evidence, that its origin can be traced to the nerves; for it is notorious that those diseases which are caused by interruptions in the transmission of nervous force, or an improper development in the great generating centres, are more generally inherited than those involving other tissues of the body, or resulting from the operation of different influences in the economy. Thus, insanity descends from sire to son through many generations—whilst convulsions, epilepsy, hysteria, chorea, and various other affections of the nervous system are the fatal heirlooms in many families.

The constant use of improper aliments also occupies a conspicuous place in the catalogue of causes whereby consumption is produced. Now it is evident, if, when they are originally taken in the stomach, a condition of health exists which secures their proper digestion and assimilation, the amount of nutritious matter contained in them would be appropriated by the tissues, and, although emaciation and enervation would result, they could only indicate the fact that assimilable elements had not been ingested in sufficient quantity. Until a specific derangement in the digestive process is effected, the tubercular cachexia cannot exist, and it is only because of the induction of a distinct morbid alteration in the system that this peculiar diathesis is developed. The various tissues of the body require the constant supply of an

organizable material of a certain quality in a definite quantity, and without this supply, a change is effected in their organic character, and an alteration occurs in their manner of executing the particular function for which they are designed. Nervous tissue is distinguished not only by its intrinsic delicacy of structure and excessive sensibility, but also for the importance of its functions and the variety of its relations; and when the material habitually consumed is bad in quality, and diminished in quantity, it, as a matter of necessity, first feels and manifests the operation of this debilitating and morbific influence. In a word, the tubercular cachexia is developed thus:—

There is improper material taken in the stomach; enervation and emaciation ensue; the nervous system feels most sensibly the withdrawal of appropriate pabulum; a proper supply of nervous force does not reach the organs of secretion connected with the digestive apparatus; torpor is produced; a positive interruption of the process results, and a condition of disease is developed.

M. Fourcault and Dr. Beddoes think that the skin is primarily affected, and in such a manner that its functions are interfered with, whilst the lungs become secondarily involved, either through sympathy, or in an effort to eliminate the elements which should have been excreted on the surface. It is certain that impure air, &c., do produce a powerful impression on the skin, and that, in many instances, its offices are entirely suspended; but it is equally true, that the effect on the skin is one of sedation and depression—one affecting the nerves which are there distributed—and that the cause which produces an impression on a tissue whose connection with the nerves is so intimate and extended, must in that way create no inconsiderable disturbance throughout the whole nervous mass. If sedation be produced on the nerves at their extremities, the same impression will be made at their internal terminations, and of the other nerves connected with them—those which most resemble them in function, or which are more susceptible to the influence of any depressing agent, will most readily take on the same action or condition, and thus reproduce in the organs to which they are distributed, a state similar to that which exists on the surface. Thus it becomes plain, how and why an impression made on the skin can develop the tubercular cachexia in the human economy.

The last series of morbific agents to which I will refer, are those which connect themselves with the emotions. It is universally admitted, that the gratification of lust, indulgence in onanism, depression of spirits, violent grief, and, indeed, all passion whereby immediate depression or subsequent reaction is induced, tend materially to the development of the tubercular diathesis. Thus it has been established by the investigation of M. Lombard, of Geneva, that twice as many die of consumption among the destitute as among the rich and contented; and Morton[1] declares that he knows of "no cause more certain in the development of phthisis than grief, especially when it is long indulged;" and "that nearly *every case* of the disease which had come under his observation, was occasioned by mental suffering of a protracted duration." Laennec tells of a community of nuns, which, in consequence of having to submit to certain moral influences of a most terrible nature, was so victimized by consumption, that it had to renew itself three times in ten years. Hippocrates himself affirms, that "the abuse of youth by inordinate indulgence in the pleasures of love, has the most unhappy influence upon the development of consumption." Dupay[2] tells of the terrible ravages made by phthisis among the French soldiers detained at Chatham, in consequence of

[1] Treatise on Consumption.

[2] Thèse de 1847.

their distress at being confined in prison, and desire to return to their native land. Amistoy expresses himself thus: "La misère, á coup sûr, est un grande cause de débilité, et par conséquent de phthisie; mais il-y a une autre cause qui ruine encore plus promptement et plus profondement l'organisme; ce sont les passions tristes et concentrées."[1]

Wood says, that exhausting indulgences, grief, anxiety, disappointment, whether of the affections or in business, are among the predisposing causes of phthisis.

Williams enumerates among the most common causes of the constitutional origin of consumption, "depressing passions, such as disappointed love, anxiety, or distress from reverses of fortune, or other severe calamity, and venereal excesses."

I have thus been particular in bringing forward the statements of these writers, not because there can be any doubt respecting the fact to which they testify, but as a sure means of making it conspicuous and comprehensible. My object is to impress it fully on the minds of my readers, so that I may the better illustrate the truth of the conclusion which is deducible from it. Now let me ask: How do these causes operate in the production of their results? Is it through the instrumentality of the nerves, or not? Do not all mental states directly influence the nervous system? Cannot the wear and tear of the mind be detected by the destruction it occasions to the nervous tissue, and the presence of that *débris* in the excretions? These questions require an affirmative answer, or the reciprocal relations of mind and nerve is an idle fancy, the connection between cause and effect a chimera, the laws of nature uncertain in their operation, and the long established opinions of the most learned physiologists visionary and unreliable. Here, then, we have a certain effect associated with a particular cause, which, from its intrinsic nature, is exclusive in its operation, and it follows that the relation between the two is necessary and invariable. A protracted state of mental depression produces nervous sedation and debility as a matter of course, and hence they may be assumed as synonymous as far as they relate to the system at large. This is the *cause* to which I have referred above. A tubercular diathesis implies the existence of a certain impairment of the digestive process, which manifests itself by a faulty transformation of the oleaginous elements into chyle, an insufficient formation of fibrin, &c., and it is fair to consider them (that is, the internal derangement and external manifestation) as identical also. These constitute the *effects* of which I have previously spoken. A certain abnormal state of the nervous mass produces, then, that condition of the digestive apparatus which prevents the formation of a proper emulsion out of the fatty matters ingested, and in this manner it becomes apparent that the cause of consumption *must* originate in the nervous system. It is evident, that an impression made on the nerves can only affect the process of digestion, by increasing or diminishing the amount of nervous force distributed to the organs by which it is affected. If the amount be augmented, as shown by Bernard, the organs will secrete a greater quantity of the fluid appertaining to them, and the process will be more active than under ordinary circumstances; and, on the other hand, when there is a deficiency in the supply, torpor ensues, a smaller amount of fluid is poured out, and digestion is impaired. It is manifest in the tubercular cachexia, that, so far from there being activity in the process, the most unmistakable impairment and derangement exist, and the conclusion is inevitable, that the peculiar morbid pheno-

[1] Thèse, 1853.

mena to which I have alluded result from an improper supply of nervous force to the pancreas and other organs connected with the digestive apparatus.

(2.) *Special Causes.*—It is not important, in this connexion, to investigate the nature and operation of those influences which tend to develop phthisis, and for that reason I will limit myself simply to an enumeration of them. These causes may be divided into two classes also—Mediate and Immediate. (*a*) Mediate causes. These do not exercise any direct influence upon the lungs, but affect them secondarily. Thus—the constant confinement of the body to the same attitude; sedentary habits; improper clothing; suppression of habitual discharges, and all those agents which *indirectly* produce congestion of the pulmonary membrane or tissues. (*b*) Immediate causes. By these are meant all causes which directly affect the lungs, producing irritation, congestion, or inflammation in them. To this class belong those professions in which the lungs are constantly affected by the contact of irritating substances, as stone-cutting, scissor-grinding, &c.; pneumonia, bronchitis, emphysema; and everything which directs the circulating fluid immediately upon the pulmonary tissue. It will be seen, however, that this distinction is merely a nominal one, and that both classes of causes require the development of a certain amount of irritation, congestion, or inflammation of the lungs, as an essential condition to their successful operation.

In another part of this paper I mentioned the fact that tonics exercise a most beneficial influence upon this disease. I propose now to consider the nature of the action of this class of medicines, for the purpose of demonstrating still more conclusively, that the development of the tubercular diathesis depends upon some lesion of the nervous system.

It cannot be denied that tonics act directly on the nervous mass, and that their beneficial influence is owing to the effect which they produce on that particular tissue. They stimulate gently, but effectually, the nervous centres, so that an increased amount of nervous force is generated and transmitted to the various organs, and in that manner conduce to the health and harmony of the whole system. This explanation of the action of these remedies is universally admitted, and it is unnecessary to inquire further into its truth. It is well known that the mistaken opinions of Sydenham, Portal, Morton, Rush, and others,[1] respecting the essential nature of phthisis, which led to the employment of the lancet and other antiphlogistic remedies, have given place to sounder views on the subject, and that a more rational and successful treatment of the affection is pursued at the present day. Without considering it a chronic pneumonia, as taught by Broussais, or a perverted secretion, as supposed by Andral, Carswell, Forbes, and Clark, the Profession, with a singular but most fortunate unanimity, has adopted that explanation of its phenomena which attributes them to the operation of some cause that depresses the nervous system, and in that manner prevents the proper performance of the digestive functions. Constant exercise in the open air, together with the use of tonic remedies, is now recommended everywhere, as the most effectual means of relieving the peculiar morbid condition known as tubercular diathesis. Now, as no remedy can be more of a *tonic* in its influence on the system than exercise, and as the medicines selected belong to *that class* exclusively, it follows that the necessity which exists for this course of treatment, demonstrates that a condition of debility and torpor has been induced in the economy, causing the generation of a deficient supply of nervous force, and its improper conduction to the various organs.

I have thus examined at length into the circumstances which attend an

[1] Stokes still urges the antiphlogistic plan.

improper digestion of the fatty elements of the food, as it appears in connection with the tubercular cachexia, and have demonstrated that no emulsion is formed, and no assimilation takes place because of some defect in the pancreatic juice, dependent upon an improper supply of nervous force to the organ by which it is secreted. The explanations given seem to be more reasonable than those of Bennett, and I trust they will prove satisfactory to my readers.

M. Bernard has shown, by many interesting and conclusive experiments, that the liver has three most important functions—Depuration, Sanguification, and Equilibrium.

(1.) *Depuration.*—It has long been admitted that the liver, by secreting bile, assists the lungs in the elimination of carbon from the economy. This fact is substantiated by comparative anatomy, which demonstrates the antagonism of the two organs, at the different ages and the several degrees in the animal scale. Some suppose that the liver separates the bile from the blood, so that its carbonaceous elements may be burned off in the lungs; but this opinion has not stood the test of experience. Under ordinary circumstances, there are more of the carbo-hydrogenous elements formed than the lungs can burn off, as is shown by the deposition of adipose in the various tissues; and hence the existence in the economy of another organ by which this excess can be disposed of. If they were reabsorbed after being eliminated, the liver would be called upon to perform an unnecessary office in secreting them originally, and instead of being a depurative organ, it would possess features of an entirely opposite character. One of the functions of the liver evidently is, to eliminate from the system that surplus of carbon and hydrogen which is not required by the tissues or the lungs.

(2.) *Sanguification.*—In addition to this function of depuration, which has been recognized by all observers, Bernard contends that the liver has other offices. He has shown by positive experiment that this organ is instrumental in the formation both of fat and fibrin. Besides the appropriation of oleaginous material from the chyle, there is another source of fatty supply to the system. Magendie established by experiments, that whatever might be the amount of fatty material taken in the stomach, only a fixed and limited amount was acted on by the intestines, and a still smaller quantity assimilated by the various tissues. Boussingault fed ducks and pigeons exclusively on fat, and found but little more oily matter in their blood, than in that of a number of the same birds to which all food had been denied. Pusay found, in fattening geese, that the oleaginous matter formed in their bodies was more than double the amount that could be extracted from the corn consumed. These facts necessarily indicate the existence of some other means whereby fat is produced in the economy; and hence the investigation of Bernard, by which was discovered the manner of its formation. Beginning by refuting the theories by which Liebig and Chambers had attempted to account for the results of the above experiments, he demonstrated that the blood which *enters* the liver has no fat in it, whilst that in the hepatic veins *coming from* it contains oleaginous material in abundance, whether the aliment taken in the stomach possesses the fatty element or not; that "the blood in the arteries coming from the lungs through the heart, contains nearly as much fatty matter as the pulmonary arteries, and that such is the case throughout the arterial circulation; while, on the contrary, in ordinary venous blood, there can scarcely be discovered a trace of it;" and that a section of the pneumogastric nerve, or a violent impression made on the nervous system, materially interferes with the production of this material.

By a course of reasoning, and experiments precisely similar, he arrived at

the same result respecting the formation of fibrin. He found that "the blood which enters the liver, contains in large quantity the digested azotised matter, and but little fibrin, even when the animal has been fed on meat. Whereas, the blood of the hepatic veins contains much fibrin and but little of the albumen: and further, that this difference is only observed during digestion." From these facts he concluded that it is the function of the liver to produce fibrin for the blood.

(3.) *Equilibrium.*—There is a constant demand on the circulating fluid both for fat and fibrin; and hence the necessity for the continuous development of these materials. The liver thus becomes the instrument by which this equilibrium is maintained in the blood and health secured to the economy.

Now, it is evident that the performance of these various functions is essential to the health of the economy, whilst an interruption of them must produce a succession of morbid phenomena of a definite character. If depuration be not effected, the burden of combustion and elimination must be thrown upon the lungs, and a disposition to disease in that organ will manifest itself. If fat be not formed, there will be a demand made upon the tissues in which oleaginous elements have been deposited, for carbon and hydrogen, and emaciation will ensue. If fibrin be not properly generated, the tissues will not be renewed, a cachectic condition of the system will be developed, a depression of the vital powers will result, and the exudations of plasma will lose their plastic and organic character. In a word, that condition of things will present itself which is recognized as the tubercular diathesis.

In a previous article it was demonstrated, that an impression made upon the nervous system by which its generating or conducting powers are interrupted, operates in such a manner on the organs concerned in secretion, as to interfere with their normal action and to restrain or alter their natural fluids. If, then, it can be shown that the functions of an organ are interfered with, without the interposition of a local and palpable influence, it follows, necessarily, that some morbid impression has been made upon the nervous system which has operated as *the cause* in the production of these particular morbid effects. But the functions of the liver have been materially interfered[1] with, as is evinced by the symptoms which characterize the tubercular cachexia, and hence it follows that the primary lesion in phthisis consists in the existence of a condition of debility and inactivity in the nervous system. We have, then,

(1.) A condition of nervous debility.

(2.) A withdrawal of the proper nervous supply to the pancreas and liver, producing torpor in them.

(3.) An interference with the natural functions of these organs.

(4.) Emaciation, enervation, pulmonary irritability, unnatural products, and the whole train of symptoms which distinguish the consumptive diathesis.

The most important changes effected in the economy are those to which the blood is subjected, though they follow naturally from the explanations already given respecting the essential nature of this particular diathesis. As a matter of course the red globules and fibrin are diminished, whilst a relative increase takes place in the albumen.

(I.) *Organic Impression.*—When the tubercular diathesis has been developed, a morbid impression is produced upon the lungs, which renders them particularly liable to congestion and irritation. The blood no longer abounds

[1] Clark, Abernethy, Philip, Ayre, and Todd.

in rich supplies of organizable elements; the cell-germs which were once conveyed to the remote tissues, and deposited as the nucleus of a plastic structure, have been replaced by a degraded element, which inclines to exudation and is susceptible of no higher development than that which characterizes the aplastic deposit. The evil produced by the presence of such elements in the blood demands their withdrawal, and that organ in which a proclivity to irritation has been developed, and whose function is most essential to vitality and health, becomes at once the instrument by which this elimination is attempted, and the receptacle of morbid products. The lungs are susceptible to the action of the morbific agent, both from causes which are original or intrinsic, and those which are acquired—the distinguishing feature of each consisting in the fact, that it promotes either congestion or irritation of their membrane or tissue.

(1.) *Original Causes.*—The lungs are susceptible to morbific impressions for the following reasons: because of the great amount of blood circulating in them; they are constantly the seat of vital action and organic change; their lining membrane is exceedingly delicate; secretions are prone to collect in them instead of being removed.

(2.) *Acquired Causes.*[1]—In phthisis we have—1st, an interruption of the function of the skin, which throws the burden of exhalation on the lungs; 2d, a general debility, by which every tissue is weakened; 3d, excessive action in the lungs because of the improper performance of depuration elsewhere, and the manner in which combustion takes place in the other structures, &c. In this diathesis, these causes combine, and render the lung so irritable and inflammatory, that it becomes necessarily the centre of sanguineous determination and exudation. As the plasma thus poured out is deficient in healthy fibrin, and as the tissues with which it is brought in contact do not possess their normal amount of formative power, proper organization is impossible, and hence, a low, retrograde, aplastic product is developed.

§ II. I shall devote this article to a brief consideration of the views entertained at different periods respecting Phthisis, and an examination of the nature of the tubercular deposition in the Pulmonary Parenchyma. In regard to the nature of the disease, a variety of conflicting opinions have been expressed by various writers.

Hippocrates evidently knew very little about this affection, for he considered phthisis "an ulceration of the lungs, having for its essential character an abscess which produces *pus.*" Galen was no better informed, for he agreed with Hippocrates in regard to the disease and its product.

Morton says, that "in consequence of some essential depravity in the blood, there is separated from it a material of an unhealthy and unnatural character, which is *secreted* in the tissue of the lungs, and diffuses itself into the other organs."

Portal thinks, that "indurations which are the product of inflammatory action, really constitute the basis of phthisis." Baumes and Bayle describe simply a pulmonary ulceration as phthisis, and confound pus with tubercle. Langlois makes tubercle an engorgement of the lymphatic ganglions. Van Swieten and Fournet believe that they originate in extravasated blood. Laennec considers tubercle an organized body having a special existence and a peculiar character. Billings regards these products as a strumous disease of the small lymphatics of the lung, growing by the addition of lymph,

[1] See Fourcault, Williams, Beddoes, and others.

and assuming various grades of organization according to the condition of the circulating fluid. Gulliver and Vogel agree in saying, that "it is organized and contains cells, and that it spreads by its own inherent power of development." Broussais teaches that inflammation of the lung is the essential cause of the whole morbid series; whilst Hufeland and Piorry think, that though this may be the proximate cause, there is a previous condition of debility necessary to its operation. Boerhaave says, "consumption is developed with most facility where the air is damp and unfavourable to free perspiration; causing the particles which should be thrown off by that operation to collect in the system."

The most popular theories, however, are those which have been proposed by Andral, Carswell, and Williams. Andral says: "Tubercle is nothing else than the *secretion* of a matter, which seems to be produced indifferently either in the last bronchi, in the vesicles which succeed them, or in the interlobular cellular tissue. This matter, which seems to be primarily liquid, becomes solidified at a period more or less remote from that at which it was secreted, and becomes tubercle."

Carswell[1] believes "tuberculous matter to be a secretion *sui generis* as totally destitute of organization, as effete matter continuously separated from blood when that fluid is in an unhealthy state, and thrown out on the surface of mucous membranes, and producing bad consequences only in proportion as it accumulates in organs, impedes their functions, and acts on them as foreign matter."

Williams[2] refers tubercle "to a degraded condition of the nutritive material from which old textures are removed and new ones formed; and differing from plasma not so much in kind, as in degree of vitality and capacity of organization."

It is manifest, from the investigations already attempted in this paper, that the last explanation approaches nearest the correct one, for the reason that it is based upon proper views of the pathological condition characteristic of the tubercular diathesis, and is susceptible of demonstration, both by *à priori* arguments and *à posteriori* deductions. It is plain, that a peculiar irritability of the lungs must occasion inflammation in them, and that, as the plasma is deficient in healthy fibrin, and the tissues wanting in their normal formative power, the materials which should have been appropriated fail to be organized and degenerate into tuberculous matter.

Nature of Tubercle.—Bennett draws the following conclusions respecting the nature of this product:—

(1.) Tubercle consists of an animal matter mixed with certain earthy salts.

(2.) The relative proportion of these varies in different specimens.

(3.) The animal matter certainly contains a *large amount* of albumen, whilst fibrin and fat exist in very small quantity.

(4.) The earthy salts are principally of the insoluble phosphate and carbonate of lime.

(5.) Very little difference exists between the matter of tubercle and other compounds of protein.

These conclusions, especially that which refers to the animal matter contained in tubercle, follow necessarily from the explanations given of the changes which occur in tubercular cachexia, and hence, they become most convincing and unanswerable proofs of their logical truth and pathological accuracy. If the normal amount and quality of fibrin were generated, the products of

[1] Williams and Clymer on Respiratory Organs. [2] Principles of Medicine.

exudation would not only contain that substance, but would present distinct evidences of its power of organization, whether they were appropriated or not; and, on the other hand, if it were replaced by albumen[1] there would be neither appropriation nor organization, and the matter deposited would contain that principle (albumen) in excess. Tubercle contains but little fibrin, and does not organize. Its principal constituent is albumen, as shown by positive analysis; hence, the conclusion is irresistible that the blood is deficient in the one and rich in the other. If fibrin be not produced, then, the organ which generates it naturally does not act properly. But that organ, the liver, *will* perform its functions unless it be prevented by the interposition of some local cause, as congestion, irritation, &c., or the withdrawal of its normal supply of nervous force. Examinations made before and after death, conclusively demonstrate that this local impediment does not primarily exist, and it follows, both from this exclusive argument and from actual experiment on the pneumogastric nerve,[2] that the cause of the interruption is to be found in some altered condition of the nervous system. If this alteration were upwards, that is, in the direction of excitation, the organ would act more promptly and effectually; whilst if it were in the opposite direction, towards depression, torpor would result. It is evident, then, that this alteration in the system, that state which is the primary and essential lesion in the tubercular cachexia, consists in a condition of depression of absolute nervous debility, and nothing less.

Rokitansky[3] divides tubercles into three kinds: simple-fibrinous, croupo-fibrinous, and albuminous. Laennec and others describe several varieties; but it is now generally admitted that they are all different forms or conditions of the same substance. Robin declares that tubercular matter is invariably yellow; but this inquiry is not material to the subject under consideration, and consequently I shall not pursue it further.

§ III. In the first part of this paper several conditions were assumed to be essential to disease, and it now remains to be determined whether or not phthisis, as explained in the preceding pages, complies with all of them.

(1.) An altered condition of the system resulting from the action of some general cause, and favourable to the operation of some particular one, was declared to be the first step in the morbid process whereby disease is developed. I have already shown that in consequence of the effect produced by the general causes to which I have alluded, a condition of debility, of low, vital, and organic action results, in which the circulating fluid becomes vitiated, and by which the lungs are so impressed, as to become particularly susceptible to all irritating and congesting influences, whilst their formative power is materially abated.

(2.) A particular cause acting in a special manner, was the next element mentioned as necessary to disease. From the explanations given already, it is evident that phthisis is not developed until some special cause presents itself by which the pulmonary tissue is made to take in a particular inflammatory action, wherein exudation takes place, which, from the impoverishment of the circulating fluid, and the altered condition of the tissues themselves, fails to organize, and deposits itself in the form of tubercle.

(3.) Effects or symptoms were then referred to as constituting the last link in the morbid chain. In phthisis they are twofold—that is, those which

[1] "Fibrin may be considered albumen in an advanced state of development."—*Simon.*

[2] See Bernard's Experiment.

[3] Handbuch der Pathologischen Anatomie, 1846.

result from the action of the general cause, and others which are referable alone to the special cause, present themselves as concomitant phenomena. By the first, I mean those symptoms which are characteristic of the tubercular diathesis; and by the second, I refer to the effects of tubercular deposition upon the system at large.

These effects are so well understood as to render it unnecessary for me to attempt any description of them in this connection. I have thus shown that phthisis complies with the conditions essential to disease, and that in doing so it serves to substantiate the truth of the explanation given of all morbid processes.

In order to comprehend fully the deductions intended to be drawn from these conclusions it is necessary to revert to that portion of this paper in which the doctrine of antagonism was expounded and demonstrated. It was thus shown that the only sure means of altering any particular condition of the economy, was to induce a state dissimilar and antagonistic to that already existing. Effects or symptoms were declared to be the only means whereby causes make themselves known; and as the particular cause depended for its operation on the existence of a general morbid state, induced by the action of some general cause, a continuance of the same morbid phenomena indicated that no change had been effected in the original abnormal condition; and that the curative process had not been commenced; whereas a change in the phenomena, proved that the original abnormal condition had been altered, and that the succession of morbid actions was broken up. From these considerations it is evident that phthisis must be opposed by that condition which is antagonistic to it, and that the induction of phenomena dissimilar to those characteristic of this disease establishes the fact that its progress has been arrested. If it can be shown, then, that pregnancy establishes a state in the economy which is distinguished by effects directly opposed to those induced by phthisis, then it follows that the particular cause has ceased to operate—that the morbid condition by which it was favoured and permitted to affect the system has been removed, and that an antagonistic and curative impression has been made upon the economy. The object of the succeeding pages shall be to investigate the nature of pregnancy, in order to demonstrate that it is essentially antagonistic to the progress of consumption.

Chap. II. § I. *Pregnancy.*—Nothing can be more important in all its bearings than that process by which the ovum is fecundated, the uterus impregnated, and the fœtus developed. Upon its proper performance and successful issue the perpetuation of the race depends, whilst the most serious physiological changes accompany and distinguish it. The organs concerned in this important work, possess a degree of adaptation to the duties imposed upon them as extraordinary as it is complete; a delicacy of structure unsurpassed by that of any other tissue, and an intimacy of relation with the system at large as wonderful in itself as it is important in its consequences. The uterus, in the female system, is the great fountain of sensibility and sympathy. When its tissues are intact, and its functions properly performed, the highest condition of health is maintained in the economy; whilst the slightest deviation from the normal standard, either in its structure or in the manner of its action, is felt throughout the entire frame, and responded to by every organ. Hippocrates long since enunciated a truth which has been universally received: "Morborum omnium qui muliebres vocantur uteri in causa sint;" whilst the declaration of Van Helmont, "propter solum uterum est mulier, id quod est," has passed into a physiological axiom. The actions whereby pregnancy is developed and perfected have their seat in this organ, and hence the nature of the relation

which they sustain to the organism. Their influence upon the economy is most powerful and controlling, whilst the system in turn materially affects and modifies them.

Under ordinary circumstances, each cell possesses the power of reproduction; the tissues are capable of selecting and appropriating those elements which are essential to their nutrition; and the organs have an inherent ability to perform their functions properly. When there has been no impairment of the vital principle, and the body is in a state of absolute health, these processes are performed in such a manner as to secure the most perfect equilibrium and harmony in the economy. Physiological acts, then, require this condition of things as an essential prerequisite to their proper peeformance, and when they are successfully executed, evidence is thereby presented of the existence of a condition in which the vital principle possesses its normal amount of activity, and the system is up to the standard of health. The uterus sustains relations of the most intimate and complicated nature with every other organ of the body. When diseased, the whole system feels the morbid impression, and presents infallible evidence of sympathy and suffering, whilst it in turn responds to the affections of other organs, and suspends its functions upon the invasion of any serious malady. If the integrity of the uterine functions be so dependent upon the healthful condition of the organism, and so indicative of the absence of serious disease, then, *a fortiori*, the perfection of its highest physiological act must require the suspension of all morbid conditions, and serve to demonstrate conclusively that they have been suppressed. Hence, the vast importance of this process, not only because of its effect upon society, but for the reason that it exercises a controlling and conservative influence upon the whole economy, whilst its successful issue demonstrates the abatement of abnormal actions and the suspension of all diseased conditions.

In treating of the nature of this great physiological process, I shall limit myself to a consideration of its effects upon the uterus itself and the system at large. One of the first evidences of pregnancy is the suspension of the menstrual flow, which results, not on account of any disease, general or special, but because the fluid is required for other purposes in the system. The symptoms which ordinarily attend the retention of this fluid, do not appear, for the reason that nature in her effort to perfect a high physiological act, gives to the system a certain tolerance or power of resistance that it does not ordinarily possess. The structure of the uterus is materially changed; its fibres are separated; numerous interspaces are left between them, and a *positive addition* is made to its substance. The cavity of the womb is materially increased in size, and filled up, not only with the fœtus itself, but with an entirely new membrane of fibrinous origin and character, rapid in its development, and important in its purposes. The vessels increase in number and capacity, which augmentation of vascular machinery implies, of course, an increase in the amount of circulating fluid in the womb. The nerves become hypertrophied from an absolute *increase of substance*, so that the sensibility of the organ is augmented, and its relations with the organism rendered more complete. In a word, it not only becomes the centre of nervous and vascular determination, but by reason of the increased vital action in it and the system at large, it acquires a principle of growth, and so increases in capacity as to accommodate itself to the important development within its cavity.

It produces in the system a condition of increased action, approaching even to plethora. This is evinced by the addition made to the vascular machinery; the augmentation of circulating fluid; the buffy coat of the blood; the unusual frequency of the pulse; the acquired tolerance of the lancet; increased susceptibility to the action of stimulants; difficulty of employing tonics to

advantage, and the proteinaceous products which are developed within the womb. The testimony of able writers may be adduced in favour of it also. "In the earlier stages of pregnancy especially, general and local plethora frequently presents itself." (Cazeaux.) "In pregnant women a physiological condition appears in which there is a positive augmentation of the mass of blood relatively to the capacity of the vessels." (Becquerel and Rodier.) "There is a tendency to the production of more blood than formerly." (Burns.)

"The general state is said to be one of plethora." (Churchill.) "The state of pregnancy is one of increased vascular action, not only in the great organ primarily affected, but generally throughout the system, by which a disposition to plethora is created." (Montgomery.)

Authorities might be multiplied indefinitely, for nearly every writer on the subject expresses the same opinion respecting the state of the system at this important period. Now, whatever may be the views of these authors, respecting the exact definition of the term plethora, there can be no doubt of the fact which they intend to assert, that a condition of excitement, of ultra health, of increased vital activity, attends and characterizes pregnancy in its development and progress.

This disposition to the establishment of inflammatory action, fevers, acute affections, &c., is so imminent as to require the production of a certain method of relief to the economy, whereby its normal condition may be secured and retained. A kind of safety valve is established through which this morbid proclivity may work itself off, without producing disease to the system. Thus, Denman has remarked, "It is a popular observation, that those women are less subject to abortion and ultimately fare better, who have such symptoms as sometimes attend pregnancy, than those who are exempt from them." Nausea, vomiting, disgust for food, &c., serve to restrain the disposition to disease characteristic of this condition, and to keep up the natural balance in the system, by lessening the quality of the circulating fluid, diverting nervous excitement, preventing plethora, and developing that state in the economy which is essential to the perfection of nature's most important work.[1]

Nothing is perhaps more indicative of the existence of this state of repletion, than the necessity which presents itself for the employment of the lancet, and the unanimity with which its advantages have been recognized by the profession. It is true that Hippocrates declares, "mulier in utero gestans, incisa vena abortit, idque magis si est fœtus auctor;" but his opinion is based upon the supposition that the suppression of the menses indicates a *necessity* for a superabundance of blood, and that its abstraction is in opposition to a law of nature. He, however, *purged* pregnant women excessively, as a means of preventing the appearance of plethora; and thus assisted in the establishment of a principle in direct opposition to that which he has enunciated in the 35th aphorism of his 5th Book.[2] Fernel was the first who dissented from the views of the sage of Cos, and bled pregnant women. He expresses himself in the following manner:[3] "Il ne sera pas hors d'apropos d'examiner si la grossesse doit êtré une contre indicacion a la saignée. Des considerations spécieuses appuyées sur l'avis d'Hippocrate, nous engageraient à la reserve lorsque il s'agit des femmes enceintes, même atteintes d'une maladie grave dans la vue du fœtus, qui pourrait en souffrir. Mais il n'est nullement constant de voir avorter une femme enceinte à laquelle on ouvre la veine, pas plus que de voir mourir necessairement une femme enceinte

[1] Churchill, Dewees, *et al.* [2] 1558. [3] Ferneli Opera, liv. 2d.

atteinte d'une grave maladie."[1] Guillemeau, who lived towards the end of the 16th century, sustains Fernel and gives both rules and reasons for the use of the lancet in pregnancy. Mauriceau says, that in his time (17th century) nearly all pregnant women insisted on being bled at half term, and the seventh month. He makes a just criticism on the teachings of Hippocrates in the following words: "Cet aphorisme ne nous doit pas defendre l'usage de la saignée quand le cas le requiert; mais il nous fait seulement connaitre, qu'il s'en faut servir avec une grande prudence, d'autant qu'il y a telle femme qui a besoin d'être saignée trois on quatre fois, et quelquefois davantage pendant sa grossesse, et a une autre deux seulement suffisent." In the first half of the 18th century, Dionis, Puzos, and Lamotte speak of *preventive* bleedings, and recommend the employment of the lancet. Dionis thinks that a woman should be bled at four months and a half, at the seventh month, and again at the eighth month, if plethoric symptoms continue to present themselves. He gave as reasons for the employment of the lancet, the following facts: a larger amount of blood is produced than under ordinary circumstances; an unusual supply is retained in consequence of the suspension of the menses; those women who menstruate during pregnancy are healthier than those who do not; and plethoric symptoms are relieved by this remedy with facility and certainty. Puzos advocates bloodletting also, but insists that the number of bleedings requisite for the proper control of morbid symptoms, cannot be fixed upon in advance. Levret bled in the cases marked by plethoric tendencies, and recommended the lancet as an invaluable agent in the accidents incident to that particular condition. The ablest writers of the 19th century have approved and tested those principles thoroughly. Thus, Gardien, Velpeau, Dubois, Piorry, Andral, Cazeaux, Becquard, Rodier, Chailly, and many others, have arrayed themselves among the advocates of the lancet, and borne irrefragable testimony in support of its utility, propriety, and necessity, in the arrest of that plethoric condition developed by pregnancy in the female system. Denman affirms that "venesection is found useful even in those constitutions which do not ordinarily bear it well." Dr. Burns says, "it is necessary frequently to lessen plethora and local irritation by bloodletting." Dr. Dewees draws the following conclusions, after a thorough examination of the whole subject: "Women bear the loss of blood better when pregnant than at any other time. The acute diseases of pregnant women require a more extensive use of the lancet than under ordinary circumstances." But it is useless to multiply authorities, as it might be done indefinitely, for the opinions thus expressed are held by the ablest writers of all countries at the present day. From a consideration of these authorities and the facts to which they have testified, the following conclusions are inevitable:—

(1.) The utility of the lancet in pregnancy has been demonstrated.

(2.) This utility depends upon the fact that a disposition to plethora exists in connection with that condition.

It must be explained, however, in this connection, that the term plethora is not employed in the limited sense of a mere excess of red globules, as defined by Andral, but as meaning either an augmentation of the whole volume of the circulating fluid, or the increase of some one of its vitalizing elements. An examination of the blood will not only show that there has been more formed than usual, but that fibrin, its most essential principle, is largely increased. According to Becquerel and Rodier, the average proportion of red globules in man is 141 to 1000 parts of blood; and in woman

[1] See Guillemeau, 1698, p. 30, et suiv.

127. This average decreases progressively during pregnancy, not because the blood becomes impoverished, but in consequence of the great demand for fibrin, and the extraordinary production of that material.[1] During the first months, it remains at from 116 to 126; in the sixth and seventh months it averages between 100 and 120; whilst towards the close of the process it varies from 90 to 100. Albumen is about 70 in the state of health; in pregnancy it descends below 60. Fibrin is never found below the ordinary standard, but is always above it. Its average toward the end of pregnancy varies between 3.69 and 4.69, lower than in any other pathological state.[2]

Respiration is slightly increased, in the first instance, but diminishes subsequently as the uterus enlarges.[3] Thus, the process of oxidation does not take place so rapidly in that organ, and the principal burden of depuration is thrown upon the liver. The nervous system is in a state of excitement, as is shown not only by increased vital action, but by the wakefulness, watchfulness, &c., which distinguish the pregnant state.

The secreting functions participate in the general excitement, as must result from the altered condition of the nervous mass, and as is established by the *action* of the *salivary glands*, the state of the skin, &c., at this critical period of feminine existence.

Thus, from the character of the process which is accomplished during pregnancy, it is evident that the absence or subsidence of all organic disease is demanded by nature, for the perfection of her most important work; whilst an examination of the changes of the uterus itself, and the organism at large, clearly demonstrates the establishment of a condition of increased nervous energy, of extraordinary vital action, and of ultra health.

§ 2.—Having considered the nature of phthisis, together with its effect upon the economy, and discussed the changes which accompany and distinguish pregnancy, I shall now attempt to contrast the two, for the purpose of showing the antagonism between them.

(1.) Phthisis has two stages, the first marked by those symptoms which distinguish the tubercular diathesis; the second characterized by the deposition of tuberculous matter in the lungs. Both are essentially morbid, depending upon positive nervous debility, marked by low vital action, and attended with distinct organic changes, of a low asthenic nature, throughout the entire system.

Pregnancy implies the existence of a physiological process in the economy, having for its prerequisite a certain amount of health, demanding the arrest of organic lesions as an essential condition to its progress and perfection, and producing a state of repletion, in which the vital principle attains its full maximum of development, and the system is predisposed to the highest grades of action.

(2.) Phthisis is distinguished by the presence of *feeble and flabby muscles*,[4] loss of strength, emaciation of person, and anemic appearance.

Pregnancy is marked by the extraordinary enlargement of the uterus, which is *composed chiefly of muscular* tissue, increase of strength, rotundity of person, and plethoric appearance.

(3.) Phthisis is preceded and accompanied by a positive impairment of the digestive process; a condition in which the nutritious elements of food are improperly prepared for the use of the economy; a state which precludes assimilation, both because of a defect in the pabulum supplied, and a diminution of the formative power of the tissues. Pregnancy is frequently attended

[1] Simon, Regnault. [2] Andral and Gavarret. [3] Rokitansky. [4] Arétée.

with an *interruption* of the process of digestion, resulting, not from any inability of the parts concerned to perform their natural functions in its accomplishment—not because nutritive elements are deficient or defective—not for the reason that the tissues cannot appropriate the organizable elements upon which they live, but in consequence of some disturbance of nervous energy, or in obedience to that instinctive sympathy which teaches particular organs to respond to the necessities of the organism.

(4.) Phthisis has among its essential elements an alteration in the components of the circulating fluid. Albumen is defective and superabundant; red globules are not produced in their normal quantity, and fibrin loses its powers of organization, and is materially diminished in quantity. As a consequence of these changes, extravasations occur readily, neither organization nor appropriation takes place, and depositions are made throughout the system, amorphous in their character, albuminous in composition, and distinctive in their effects upon the economy.

Pregnancy also produces alterations in the blood, but they differ materially from the above. Albumen remains fixed; red globules diminish in quantity in consequence of the great demand for fibrin; and fibrin increases up to the highest possible ratio. The result of this change is manifested in the products of the uterus; for there is not only developed within its cavity a fœtus, consisting principally of proteinaceous elements, but membranes, bloodvessels, and nerves, which are essentially fibrinous in their origin and constituents; all of which are the direct consequences of a high physiological act, and subservient to the most important purposes known to the economy.

(5.) In phthisis the great burden of combustion and depuration falls on the lungs; the balance maintained between them and the liver is destroyed, and the hepatic functions materially interfered with. The pancreas, salivary apparatus, skin, and secerning functions generally, are rendered torpid or irregular, whilst the fluids peculiar to the various organs are altered in quantity and quality.

In pregnancy the balance is disturbed, but the burden falls on the liver.[1] The cavity of the thorax diminishes in capacity as the fœtus is developed, so that the lungs have less work to perform, which of course imposes the labour of depuration on those organs that have a corresponding function. The skin, also, for this reason, excretes with unusual rapidity, and lends a powerful assistance towards maintaining that equilibrium which is essential to health. The pancreas indicates no debility or derangement, but secrete properly that fluid whereby oleaginous elements are prepared for assimilation. The *salivary organs* are particularly active, as has been remarked by all writers on this subject. Thus, it becomes evident that the state of pregnancy is characterized, not by torpor of the organs and deficiency of the fluids, but by a state of great functional activity throughout the whole system.

(6.) In phthisis, a state of absolute depression or debility manifests itself in the entire nervous mass, so that the normal amount of nervous influence is neither generated in the centres nor transmitted to the organs.

In pregnancy there is a condition of exaltation, of excitement, of unusual action, developed in the nervous system, as is shown by the restlessness, irritability, reciprocal sympathy, and activity of function which attend its progress. Nervous tissue even becomes hypertrophied from excessive health, for the nerves of the uterus are not only found more sensitive, but positively enlarged during the continuance of the state of gestation.

(7.) In phthisis, tonics and stimulants, both local and general, are par-

[1] Rokitansky, Montgomery, Burns, and Chailly.

ticularly *indicated*, whilst the employment of depleting measures is not only uncalled for, but positively dangerous to the patient.

In pregnancy, tonics and stimulants are contra-*indicated*, for they serve but to increase the tendency to plethora therein developed. Antiphlogistic measures, on the contrary, are rendered necessary by this state of general repletion, and play a most important part in the subjugation of all those morbid affections to which women are liable during the progress of fœtal development. In a word, an examination of phthisis and pregnancy clearly demonstrates that they are essentially different and antagonistic, both as regards their intrinsic character, the manner of their development, and the nature of the results which they produce in the economy. If, then, the doctrines of Hahnemann be true, the coexistence of these two opposite conditions is possible, and the progress of phthisis will not be restrained by the development of pregnancy. But, on the other hand, if the principle of "antagonism" already illustrated constitute, in fact, the great basis of therapeutical action, the existence of pregnancy must operate as a restraint upon the continuance of the tubercular diathesis.

It is hardly necessary to assert, in this connection, that phthisis does materially interfere with those processes whereby pregnancy is developed, for it is well known that morbid conditions cannot favour the consummation of a purely physiological act, and that a suppression of the menses is one of the earliest and most constant symptoms of the tubercular cachexia. Of course, it is far easier for a woman to become pregnant, when thus affected, than for phthisis to originate and progress during the continuance of the state of gestation, for the obvious reason that health is the *normal state* to which there is always a natural proclivity; and that Providence invariably manifests wonderful wisdom and foresight in dealing with final causes. Here, then, are two states sustaining certain reciprocal relations, which render them mutually dependent upon each other. One, by reason of the characters upon which these relations are based, serves as a check upon the other. What, then, must be the nature of the influence exerted in return? It must evidently be, one of control, of opposition, of restraint. The *second* must affect the *first*, just as the *first* affects the *second*, and it is proper to conclude that pregnancy retards the development of tubercles in the lungs.

Phthisis makes itself known by a set of phenomena of a particular character. Pregnancy is distinguished by phenomena entirely dissimilar and antagonistic. Their coexistence implies the continuance of two opposite conditions in the economy, and involves nature in the contradiction of perfecting antagonistic processes,[1] each affecting the system in all its parts and powers, at the same time and under identical circumstances. The natural antagonism between health and disease—between a state purely *physiological* and one essentially *pathological*, is sufficient in itself to account for the restraining influences which are reciprocally exerted by those two conditions; and thus for a double reason the antagonism between phthisis and pregnancy is rendered clear and palpable.

Chap. III. § I. In speaking of the special causes whereby the deposition of tubercles is effected, I mentioned that their potency depends upon a certain capability of producing irritation or congestion in the tissue of the lungs. So manifest is the fact, that the appearance of tubercles in the lungs is preceded by some irritation of their structure, that many accurate observers have main-

[1] See St. Hilaire, Meckel, Rudolphi, Serres and Vernois.

tained that phthisis originates exclusively in such a condition. Laennec has exploded this idea in a masterly manner, whilst Louis, Andral, and Grisolle have sustained his position by an array of facts and argument perfectly satisfactory and overwhelming. That irritation, congestion, &c., do play an important part in the development of phthisis, can be easily established, both by a reference to authorities, and an examination of the phenomena connected with that disease.

Wood declares: "Anything which is capable of irritating or inflaming the lungs; of producing an unusual influx of blood; or an unusual secretory effort, acts as an exciting cause to the deposition of tubercles in those predisposed to them."

Laennec says: "Although inflammation cannot by itself produce tubercles, it may *hasten* their appearance, in the same way as a soil well tilled after a long fallow, or left fallow after several years' culture, will cause many seeds to germinate which had lain within it in a state of inactivity for several years."

Cruveilhier gives the following experiment: "I injected through an opening made in the trachea of a dog, two ounces of mercury, the greater part of which was rejected by coughing. The dog, however, did become apparently phthisical, and did emaciate. At the end of two months the lungs were crammed with tubercles, both isolated and agglomerated."

Jackson affirms, "that the most usual exciting causes of pulmonary tubercles are, neglected catarrhs, and pneumonias of a feeble grade."

Bayle even declares, "that pleurisy, pneumonia, exanthematous diseases, &c., are sometimes the cause of phthisis, but for the most part, they only hasten its advent."

Morten says, "Et equidem non dubito quin in herpes morbi primordiis catarrhi, tussesque communis frequenter in phthisim pulmonarem degenerare soleant."

Hufeland believes that, "more than half of consumptions are the results of catarrhs."

Van Swieten affirms that, "pulmonary congestion is the principal cause of the development of phthisis."

Baron and Fournet have maintained the same opinion, whilst Andral admits that "hæmoptysis is in many instances the first step towards tubercular deposition, as well as the sure evidence of the local implication."

Stokes and Clark affirm, "that some congestion of the lungs always precedes the development of tubercles."

It is well known that those influences which interfere with the functions of the skin, and thus give a centripetal direction to the current of the blood, operate powerfully in developing the disease. A phthisical predisposition is also particularly characteristic of puberty, for the reason, that there is a concentration of nervous and vascular energy upon the lungs at that period.

The invasion of consumption is also especially favoured by those occupations in which pulmonary irritation is constantly developed. Thus, stone-cutters, scissor-grinders, &c., are particularly liable to phthisis.[1]

Lieutaud and Portal furnish instances in which phthisis resulted from the irritation occasioned by continued fever.

Amestoy gives the case of a man who foolishly attempted to swallow a nail, which unluckily fell first into the trachea, and then lodged in one of the bronchi. This produced an irritation of the parts which resulted in death.

[1] See Reports of Lombard, Dumeril, and Benoiston de Chateau-neuf. Archives Générales, 1830.

A *post-mortem* examination revealed the fact, that the lungs had been filled with tubercles.

Louis tells of a young butcher who received a violent blow on the chest, and died of consumption in a very short time. From a consideration of these facts it is evident, that in addition to the general predisposition to phthisis, a certain amount of local irritation or congestion is necessary to the completion of the morbid series which constitutes the disease.

Whatever, then, operates in such a manner as to prevent or relieve that irritation, and to render the lungs less susceptible to the causes which produce it, must exercise a most healthful influence upon those predisposed to phthisis, and resist the onward march of the disease, even when its particular diathesis has been established.

§ II. I shall endeavour to prove that pregnancy necessarily opposes this sanguineous determination to the lungs, and resists the establishment of that irritation upon which the development of tubercles depends.

(1.) The great principle of derivation and revulsion is universally appreciated by medical men, and constantly invoked in the treatment of disease. Derivation, in a therapeutical point of view, signifies that action by which the circulating current and nervous energy are drawn towards a particular point, as a means of diverting them from a part in which they are producing morbid accidents. According to Nysten, it is "an artificial excitation designed to break up a tendency which manifests itself in the fluids and forces to concentrate themselves wherever a centre of irritation exists."[1]

In the human system there is only a certain capacity of nervous action and a definite amount of blood.[2] Whenever there is a nervous or sanguineous concentration upon one point, there must necessarily be a deficiency elsewhere, and hence, the philosophy and importance of the principle of derivation in the treatment of disease.

The value of revulsion in the arrest of phthisis, can be made evident by a reference to a few acknowledged facts.

The use of blisters, setons, issues, &c., has been resorted to from the earliest times, and has been found of extreme importance in the management of consumption. Exercise, by giving a centrifugal direction to the circulating current, and by stimulating the skin, &c., to proper action, frequently produces a most happy result upon the progress of that disease. Intermittent fever[3] exercises a controlling influence upon phthisis. Fistula in ano connects itself in a special manner with phthisis, and frequently retards its march, and prevents the deposition of tubercles.

Emetics have been employed in the treatment of consumption from a very early period. Many able writers maintain that the most effectual method of relieving the morbid state upon which the development of tubercles depends, is to be found in the free use of emetics. Morton particularly recommends them, and he is sustained by Robinson, Reid, Dumas, Holland, and Carswell, all able writers and eminent pathologists. Giovanni di Vittis has given this class of remedies a most thorough trial, and is convinced of their great utility, especially in the early stages of phthisis. Piorry, Bouillaud, Trousseau, Valleix, Louis, Andral, Rogie, Lisfranc, and many others, have tested the merits of

[1] "Fluentium humorem revulsio me dela est derivatio autem eorum qua jam obsiderant membrum."—GALEN.

[2] Holland's notes. Tweedie's Practical Medicine.

[3] See Mémoire de M. Carriere, Bulletin de l'Académie de Médecine, 1844–5. Mémoire par M. Lefevre, Bulletin de l'Académie, p. 968, vol. x. &c.

this plan of treatment, and testified to its efficacy in preventing the deposition of tubercles, and arresting the march of that cachexia which precedes and produces their development in the pulmonary tissue.

These facts clearly establish that consumption may be arrested before it is fully developed or perfected by the deposition of tubercles; and it follows as a necessary deduction, that when it can be established that a particular process diverts the fluids and forces of the system towards another organ, it is fair to attribute to that process certain curative powers and preventive influences in connection with the progress of the tubercular cachexia.

(2.) As soon as impregnation is effected, the uterus and its appendages become the seat of most important physiological actions and organic changes. Under the influence of the process thus established, these parts are made centres of nervous and sanguineous determination, to an extent that can only be comprehended by a consideration of the wonderful results which are there accomplished. The development of the fœtus; the elaboration of organized membranes; the increase in the vascular apparatus of the organ; the formation and hypertrophy of the nervous filaments distributed to its tissues; and the perfection, in fact, of nature's highest and most complicated physiological work, demonstrates the necessity for the presence of a full tide of blood and nervous energy in the parts concerned in this important process, and proves that such a concentration has been effected. As a necessary consequence the whole system feels the effect of this derivation; and the lungs, in common with all other organs, are relieved both from the predisposition to irritation and the congestion which has been effected in them. Thus it becomes evident that the arrest of phthisis in those predisposed to it—that is, before the disease has been confirmed by the development of pulmonary irritation, &c., and the deposition of tubercular matter—is in direct conformity with an established law of nature, and that a denial of the fact involves the plainest principles of therapeutics in an interminable labyrinth of contradictions.

§ III.—But pregnancy is not only opposed *per se* to the continuance of the tubercular diathesis, as has been shown above; it operates also by means of its secondary effects—if such an expression may be employed—in the arrest and removal of this particular cachexy.[1] Thus by diminishing the cavity of the chest, it exposes a smaller quantity of pulmonary membrane to the influence of external causes, and renders the lungs less liable to disease of an inflammable character; whilst by the pressure of the gravid uterus against the liver, stomach, pancreas, &c., it stimulates these organs to increased action, and gives additional relief to the one already suffering.

Again—some of the means whereby nature relieves herself from morbid predisposition,[2] serve in a most effectual manner to remove pulmonary irritation, and even to produce the discharge of abnormal products after they have accumulated in the lungs.[3] It is well known that one of the most frequent symptoms which presents itself in connection with pregnancy, is excessive nausea and vomiting. Now, as I have shown before, emetics are of great benefit in the tubercular cachexia, for the reason "that they prevent the development of pulmonary irritation,[4] and remove both congestion and unnatural products from the air-passages and the subjacent vesicles." It is manifest that the vomiting which connects itself with pregnancy, must operate in the same manner, and thus another excellent reason is furnished for the arrest of tubercular deposition in those predisposed to phthisis, by the development of

[1] Rokitansky. Manual of Morbid Anatomy.
[2] Denman.
[3] Carswell.
[4] Holland's Notes.

that particular symptom. It is possible also, that hæmorrhoids, which are frequently produced by pregnancy, may serve as a centre of irritation and a source of relief, in the same manner as fistula in ano usually does, and that in this way some retardation of the progress of phthisis may be effected.

Holland, in his *Medical Notes*, affirms, that nothing exercises a more potent influence upon the development or prevention of disease than the concentration of the attention upon any particular organ. This must be admitted by every careful observer of morbid actions, and is received as a truism by the profession. What can give more fixedness and concentration of attention than the expectation of being impregnated, the assurance that pregnancy has been established, and the certainty of becoming a mother? With what constant watchfulness must that woman regard her womb, who perceives that her menses have been arrested, that her abdomen is enlarging, and that a child is developing itself within her bosom? And if it be possible for disease to be removed from an organ, and for the nervous influence and sanguineous current to be directed upon another by any mental effort, under what circumstances could it be so well accomplished as when the uterus is engaged in the act of reproduction, and employed with all the changes, alterations, and labours incident to that important process? Here, then, is another reason for attributing to pregnancy the power of arresting the progress of tubercular deposition.

The object of pregnancy is to reproduce the species and perpetuate the race. Like all other physiological acts, it requires certain conditions for its perfection, which nature labours to supply with a generous and intelligent hand. Health is essential to the proper performance of all vital actions, and the amount of health demanded is always in direct proportion to the importance of the physiological process. Pregnancy implies the existence and progress of the most important process known to the economy. Its successful accomplishment requires, consequently, the maximum development of vital power, and the nearest approach to the normal standard of which the organism is capable; and hence, its proper performance is an evidence of the abatement of all serious morbid action, and the establishment of a condition essentially antagonistic to the invasion and progress of disease. This statement is verified by the following facts:—

(1.) Most women increase both in size and strength during the period of gestation.

(2.) Women who bear children habitually enjoy better health than those who do not.

(3.) Pregnant women are less susceptible to the influence of contagious diseases, epidemics, &c., than others who are in a normal condition, as has been affirmed by Bayle, Andral, Montgomery, Ashwell, Sydenham, and many others.

Thus it is evident that nature attempts to throw safeguards around this important process by inducing that condition most essential to its success, and by arresting every action calculated either to interfere with its progress or to prevent its consummation. From these considerations it is plain, that pregnancy must tend to prevent the progress of consumption with those in whom the tubercular diathesis has been established.

Chap. IV. § I. As I have thus attempted to establish by facts and arguments that pregnancy arrests the development of tubercles, I shall now endeavour to sustain that position by a reference to authorities.

"Dès qu une femme est grosse, les probabilities de sa vie augment."—*Gardien.*

"Where women who have been labouring under certain forms of disease happen to conceive, the morbid affection previously existing is oftentimes checked or even altogether suspended for a time, as has been frequently observed of persons affected with phthisis."—*Montgomery.*

"In a great majority of cases the symptoms of phthisis are suspended, or at least remain stationary during pregnancy."—*Andral.*

"It is a remarkable circumstance that pulmonary consumption is very generally suspended in its progress by pregnancy."—*Eberle.*

"During the progress of pregnancy consumption seems to be suspended."—*Heberden.*

"Des deux femmes phthisique au même dégré celle qui dévient enceinte, arrive surement au terme de la gestatione; tandisque l'autre périra avant le temps."—*Rozier de la Chassagne.*

"Phthisis pulmonalis frequently becomes modified during pregnancy, and is succeeded apparently by perfect health."—*Chailly.*

"A very salutary change is effected in the whole system, so that persons enjoy better health during pregnancy than at any other time."—*Burns.*

"The effect of disease seems also, in many cases, to be suspended during pregnancy. I do not recollect a single instance of any consumptive woman being unequal to her delivery, or having her fate hastened by it."—*Denman.*

"In females affected with pulmonary phthisis which has not reached the hectic stage, pregnancy goes on well to the full term. The progress of phthisis is often modified, and sometimes really arrested."—*Jacquemier.*

"You can understand, too, why this morbid nutritive activity, this disposition to deposit albuminous matter, should be shown in woman after the completion of utero-gestation, and in persons on the speedy healing of large suppurating wounds; circumstances which, as they continue, are known often to suspend the progress of consumptive disease."—*Williams.*

"Pregnancy cures hæmoptysis and hemorrhages distant from the uterus; chronic diseases are rendered slow in their progress, and some are cured; whilst a temporary benefit is experienced in phthisis."—*Nauche.*

"I cannot conclude better, than by a quotation illustrative of the effects of pregnancy upon existing diseases, with which, I may add, my own experience perfectly agrees. 'We have sufficient evidence to justify the belief, that pregnancy acts in a great degree as a protective against the reception of disease, and apparently on the common principle, that during the continuance of any one active operation in the system, it is thereby rendered less liable to be invaded or acted on by another; thus it has been observed, that during epidemics of different kinds, a much smaller proportion of pregnant women have been attacked than others; and when women who have been labouring under certain forms of disease happen to conceive, the morbid affection previously existing is either greatly checked, mitigated, or even altogether suspended.'"—*Churchill.*

"Nature assumes her rights, and combats every disease while this important process (pregnancy) is going on."—*Parr.*

"The fact that pregnancy not only checks the advance of existing tuberculosis, but also excludes its development, may be thus explained. As the abdomen enlarges, the thoracic cavity becomes encroached upon, and, the parenchyma of the lungs being exposed to pressure, a condition of venosity results. This is doubtless the reason why the fœtus is scarcely ever, and the placenta very rarely, tuberculous."—*Rokitansky.*

"They (consumptions) are often checked by the return of mild weather, but perhaps even in a still more remarkable manner by pregnancy."—*Gregory.*

"That pregnancy has almost an invariable tendency to suspend phthisis, is notorious. This I have known very strikingly illustrated in several cases, in which every symptom of pectoral affection ceased during the period of gestation."—*Chapman.*

"Nature, attentive to her work, seems to forget everything to carry it to perfection. The progress of fatal diseases is retarded, and pregnant women labouring under phthisis, who, in the usual course of that complaint, would soon perish, go through the regular period of utero-gestation."—*Richerand.*

"The symptoms of consumption are generally arrested, or at least greatly mitigated, during pregnancy."—*Morton.*

"Tubercular disease is rendered latent, or at least masked, by a peculiar condition of the system, or by the presence of other diseases. Pregnancy appears to retard, if not to suspend, its progress."—*Clark.*

"The arrest of phthisis is owing to that powerful excitement which the uterus receives at this critical and important period, by which the irritative pulmonary actions are subdued, and the impetus of vascular action directed into another course."—*Reid.*

This opinion numbers also amongst its supporters, Baumer, J. Frank, Bordeau, Portal, Dugès, Sydenham, Good, and many others of equal merit and respectability; and, in fact, has been almost universally accepted by medical men, from the days of Hippocrates down to the present time.

§ II. M. Dubreuilh[1] presented a communication to the French Academy in 1852, which utterly rejects the doctrine of antagonism between pregnancy and phthisis, and attempts to establish that the progress of tubercular development is really hastened by that particular condition. M. Grisolle,[2] who was appointed to report on the subject, fully sustains these conclusions, and adduces additional arguments in support of them. Neither of them, however, has examined the physiological questions involved in the inquiry, whilst both base their objections to the established doctrine on the subject upon the observation of a comparatively small number of cases of *well-developed phthisis* which have been brought within the pale of their experience. It is true that they appeal to Louis,[3] and invoke his experience and teachings in support of their positions; and, by a species of special pleading, succeed in making a very good case for themselves. They can, however, be easily met and answered, as I shall demonstrate in a few words.

1. Even if their conclusions are correct, nothing is established in opposition to the views presented in this paper. My object has been to show that pregnancy *prevents the development* of tubercles in those *predisposed to phthisis*, whilst they have laboured to prove that it does not ARREST phthisis itself, *when actually established.* It is certainly true that I have adduced facts, arguments, and authorities in support of the power of pregnancy to retard or prevent the progress of phthisis proper, but it has been done with especial reference to the establishment of an antagonism between that condition and the actual deposition of tuberculous matter, when only the tubercular cachexia exists. I have intended to show that if pregnancy mitigates, conceals, and actually arrests consumption when fairly developed, then, *à fortiori*, it must retard the deposition of tubercles in those *predisposed* to phthisis. This is the point at issue; and as the deductions of these gentlemen do not affect it in the slightest particular, the conclusion is inevitable that they have established nothing in opposition to the position assumed in this paper. I have shown that the *spark* may be extinguished by certain means; they attempt to prove that these means do not arrest the *flame;* so that the question which I have endeavoured to solve is not in the least degree decided by their investigations.

2. They have not established their position. The thirty-five instances to which they have referred, in support of their views, prove nothing when compared with the thousands of cases upon which the opinions of so many writers have been based. The authorities which maintain the existence of this "antagonism" are far more numerous than the cases collected and reported by these learned Frenchmen; and thus it becomes evident that they have done nothing towards the overthrow of this long-established and most logical hypothesis.

[1] Mémoire par Charles Dubreuilh, Bul. Académie de Médecine.
[2] Bul. de l'Académie de Médecine, tom. xvii. p. 14.
[3] Louis gives no positive opinion on the subject, and says he has not formed one.

When they have proved that pregnancy and phthisis develop conditions which are identical in their nature and similar in their results upon the system at large; when they have reconciled their necessary contradictions and peculiar antagonism, and established that an act purely vital and a process essentially morbid require like conditions for their perfection, the same laws for their government, and reciprocal support for their very existence, then will they have done something towards the overthrow of principles which the common experience of professional men proclaims to be true, and the establishment of more enlightened and logical doctrines of medical philosophy. To those acquainted with French hospitals, it will hardly be necessary to say that thirty-five cases selected from their wards, for the purpose of sustaining a foregone conclusion, do not furnish a sufficient basis for the foundation of opinions which are to establish a new principle in regard to a matter of the first importance to the medical world.

It may be urged that the fact of the development of various morbid symptoms in connection with pregnancy is an evidence that it may be perfected in conditions opposed to the normal state. To this I will answer, *first*, that these symptoms do not indicate the existence of any serious organic change, but, on the other hand, they establish the excessive development of the vital principle, and show that the peculiar state which is most antagonistic to tubercular progress has been produced to an extent that requires the intervention of nature to restrain it within proper limits; and, *secondly*, that they do not possess any morbid character when compared with that condition which, in the wisdom of Providence, they are designed to relieve.

Again, to suppose that a physiological process and a pathological action require the same conditions for their consummation, and similar laws for their government, is to convict nature of a contradiction which compromises both the wisdom and goodness of its author, whilst it precludes the study of natural phenomena upon rational principles, and prevents all advancement in the science of medicine. The universal law[1] that "nature is infallible, incapable of contradictions, and has but one plan in her views of organization," has long furnished the light by which scientific men have conducted their investigations, and supplied the only certain guide in the attainment of truth. The antagonism between pregnancy and phthisis demands, then, the suspension or arrest of this disease when the state of gestation is developed.

§ III. It may be affirmed that the proportion of females who die of consumption is greater than that of men, and that there can be no great conservative influence which operates for their protection. There is, however, no positive evidence of this fact; and, even if it were true, it would prove nothing in opposition to my hypothesis. It is true that Louis, Laennec, Papavoine, and Andral agree that a majority of phthisical cases occur among females, yet Bayle, Clark, and others have doubted the truth of their conclusions, and furnished statistics in contradiction of them. The following table is given by Clark:—

At Hamburg,	out of	1,000	cases,	555	were	males, and	445	females.
" Rouen,	"	100	"	56	"	"	44	"
" Naples,	"	697	"	382	"	"	315	"
" New York,	"	2,954	"	1,584	"	"	1,370	"
" Genoa,	"	133	"	71	"	"	62	"
" Berlin,	"	620	"	328	"	"	292	"
" Sweden,	"	3,948	"	2,088	"	"	1,860	"
" "	"	6,157	"	3,054	"	"	3,103	"
" Stuttgard,	"	500	"	256	"	"	147	"

[1] Geoffroy St. Hilaire.

Dr. Duncan shows from the Registrar's Report, the following facts: Out of 10,000 of the population of London, 828 died of consumption, of whom 457 were males and 371 females, and of the 936 who fell victims to phthisis in Birmingham, 526 were men and 410 women.

From these tables it is evident that the question of relative mortality is by no means a fixed one, and that there are good reasons for doubting the conclusions of Louis and Laennec in regard to the subject. In many thousands of instances at least, a great protecting principle has manifested itself in connection with the female system, and it is evident that without some such conservative influence the number of women who die of consumption would far exceed that of men, for the reason that their physical conformation, mental qualities, moral character, and natural habits, render them particularly susceptible to the action of those causes whereby phthisis is produced. That this immunity and protection are due to the effects of utero-gestation is evident from the following considerations:—

(1.) Pregnancy, as shown before, produces a condition of antagonism in the economy.

(2.) Pregnancy is a vital process, a high physiological act, and hence its existence is incompatible with the progress and perfection of a purely morbid effort.

(3.) Pregnancy diverts the forces and fluids *from* the lungs, and *to* the uterus.

(4.) Pregnancy is regarded by a large majority of medical men, as antagonistic to the march of consumption.

(5.) Pregnancy depends upon the existence of certain susceptibilities which are inherent in the female system, and hence it is more *universal* in its operation than any other imaginable cause.

(6.) Pregnancy, coition, &c., are particularly desired by women affected with phthisis, which constitutes a *pointing* of *nature* towards a *remedy* for the evils by which the system has been invaded.

But even if more women than men die of consumption, it establishes nothing in conflict with the position assumed in this paper.

If the natural predisposition of the two sexes were the same, and the influences around them identical, then the fact of a greater mortality among women would demand the interposition of some general cause in the production of the unequal result, and pregnancy might be assumed as that cause, both for the reason that it connects itself with the organ which has the most important part to play in the female system, and because of the *universality* of its operations. But it is entirely unnecessary to introduce any such influence for the purpose of explaining the inequality of men and women in regard to the effects of phthisis. It can be explained by a reference to the natural differences between the sexes, without searching for other causes than those which necessarily connect themselves with the progress of the disease.

Woman is naturally more delicate than man, whilst her natural susceptibilities to morbific agents are increased by her education, her passions, and her peculiar habits of life. For these reasons, consumption develops itself with more facility in their systems than in those of men, and hence, the fact of their greater mortality can be accounted for, without attributing to pregnancy any agency in effecting it. Thus, it becomes evident that though a greater ratio of women may fall victims to phthisis, pregnancy cannot occasion the difference; and as a consequence, it follows that the statements of Louis and Laennec do not contradict the assertions of this paper.

Besides this negative argument, another of a more positive character may be drawn from these considerations.

There is a natural inequality in the relations which the two sexes sustain to phthisis, dependent upon differences of conformation and character—*plain*, *palpable*, and *conspicuous*. An examination of phthisical statistics should show, then, a decided preponderance of female victims; it should demonstrate that the difference between the number of women who die of consumption and the number of males attacked, is as great as their dissimilarity of original predisposition. The fact that a larger proportion of females fall victims to phthisis, should be as *plain*, *palpable*, and *conspicuous*, as that they are more susceptible to those influences which produce the disease. But, as has been shown above, in a large number of instances the statistics of tubercular affections prove, that, notwithstanding the original predisposition of women, and their greater susceptibility to the influences whereby phthisis is developed, the proportion of victims among males is greater than among females; and even if these tables do not establish the rule in this matter, they certainly demonstrate, that so far from its being a fact, *plain*, *palpable*, and *conspicuous*, that more women die of consumption than men, the whole subject is so involved in doubt and obscurity as to justify the most contradictory opinions, and to demand much careful attention and patient research for its proper elucidation.

Some agent, then, most potent in its influence, and universal in its operation, interposes itself for the purpose of equalizing the account between the two sexes, and making up for their natural differences in this particular. Pregnancy, as shown above, most completely fulfils all the conditions involved in the existence and operation of such an influence, and hence, it is proper to conclude, that it is the equalizing cause to which this result is attributable. I will state the argument more clearly:—

(1.) There is an inequality in the relations which men and women sustain to phthisis; the former being less liable to it than the latter.

(2.) This inequality depends upon certain differences of conformation, &c., which are *plain*, *palpable*, and *conspicuous*.

(3.) An examination of phthisical statistics should show that more women fall victims than men, and that the difference in the relative mortality of the two is as *plain*, *palpable*, and *conspicuous*, as their original dissimilarity of constitution and predisposition.

(4.) An examination of statistics proves, that *it is not* a settled *fact* that more females are destroyed by this malady, and that there is a positive approximation towards *equality* in the effects of phthisis upon the two sexes.

(5.) This "approximation towards equality" shows the operation of some great equalizing cause, by which a certain amount of protection is secured to the female system, that makes up for its greater original susceptibility, and affects the general result in the manner alluded to above.

(6.) Pregnancy complies with *all* the conditions which this cause demands for its operation, and it is fair to attribute this protecting, preventing, and equalizing effect to its influence upon the female system.

I have thus attempted, by arguments, facts, and authorities, to prove—that pregnancy prevents the progress of phthisis, even when that disease is perfectly developed. Whether this effort has been successful, or not, must be left to the judgment of my readers; and to them I confide my cause, with the full assurance, not only that their decision will be equitable in regard to all that has been urged in support of my position, but that they will agree with me in the conclusion that, if pregnancy can arrest the progress of consumption when fully established, then, for a still *stronger reason* must it "retard the development of tubercles in those predisposed to phthisis."

REVIEWS.

ART. X.—*Statistical Report on the Sickness and Mortality in the Army of the United States, compiled from the Records in the Surgeon-General's Office; embracing a period of Sixteen Years, from* 1839 *to* 1855. Prepared under the direction of Brevet-Brigadier-General THOMAS LAWSON, Surg. Gen. U. S. Army, by RICHARD H. COOLIDGE, M. D., Assistant Surgeon U. S. Army. Washington, 1856.

MEDICINE, as a positive science, can only arrive at perfection, through the reduction of myriads of the most complex facts to a few simple laws, by the slow process of careful analysis and laborious investigation; the work of centuries. To this, none, perhaps, contribute more directly, than those who obtain and combine accurate and extended observations in regard to the influence of local circumstances and modes of living, as well as medical treatment, upon mortality and disease.

In the work which the Surgeon-General and his able assistants have, as a continuation of a former one, now presented to the country, a vast deal of matter of this kind, of great value, has been collected. It would be desirable, in view of the size (a heavy quarto) and comparative inaccessibility of the volume to many of the profession, to give a full summary of its contents at this time; but we are diffident of the power to do them justice. A somewhat methodical survey of the principal matters treated of, will, however, be attempted.

The *Statistical Report* consists of considerably more than a hundred different papers, transmitted to the Surgeon-General's office by the medical officers on duty at the several posts, in answer to circulars of inquiry in regard to medical topography, &c. To these are added abstracts of mortality and diseases, with copious and elaborate tables, &c. Especial credit is due to Assistant Surgeon Coolidge for his careful and judicious arrangement of these various reports, and for the handsome manner in which the volume is got up and illustrated.

The military posts of the United States have been, for the purposes of this report, classified into three great divisions, the Northern, Middle, and Southern; to which are added, also, those of Florida, Texas, New Mexico, California, Oregon, and Washington Territories.

The Northern division includes that portion of the United States which lies north of the fortieth degree of latitude, and east of the Rocky Mountains; the Middle, all that lies between the thirty-fifth and fortieth parallels of latitude; the Southern division, all that lies between the thirtieth and thirty-fifth degrees. We have, in these and the other regions just named, a vast scope of country, embracing every variety of habitable climate and locality; from Fort Kent, in Maine, and Gaines, in Minnesota, at the north, to Fort Brown, in Texas, and Key West, in Florida, at the south; from 66° 58′ to 124° 29′ W. longitude, and from 24° 32′ to 47° 15′ N. latitude; a range of 57 degrees in one direction by 22 degrees in the other.

It would be impossible to condense the great number of statements given in regard to climate, topography, &c., of the various posts, into any limits

compatible with the purposes of a review. We shall notice only those which possess the greatest interest, particularly in a medical aspect. Much information of value to the geographer, the geologist, the zoologist, and the botanist, is also contained in these well-written reports.

In the inhospitable Northern Atlantic Coast Region, but little of etiological importance presents. The only epidemic in the whole period of sixteen years upon the coast of New England, at the military posts, was one of catarrh or influenza, in June and July, 1843. The existence of intermittent and remittent fevers in this region, at some of the forts, is accounted for entirely by the transfer of troops who had imbibed those disorders in Mexico during the war, or in Florida at other periods.

"An examination of the abstract will suffice to show the certainty with which the liability to attacks of intermittent yields to the influence of a residence in this region, though the fact is more conclusively demonstrated by the original reports. The troops from Mexico reached the New England stations in September, 1848, and in the following month intermittents are reported, disappearing almost entirely within the succeeding twelve months. In December, 1850, troops arrived from Florida, bringing with them this class of fevers, which were eradicated within the following year."

In New York harbour, we find some evidence of the existence of local miasmata, particularly on Governor's Island, among the inhabitants of an insalubrious place called "Rotten Row." Bedloe's Island, two miles nearer the ocean, is asserted to be entirely free from malarious influence, notwithstanding the existence, on the New Jersey side, of extensive salt marshes.

The interest which has lately attached to the vicinity of Fort Hamilton on Long Island, on account of the occurrence of yellow fever there in 1856, gives importance to the statements of Assistant Surgeon Eaton, in 1852, in regard to its topography.

Fort Hamilton is on the southwest corner of Long Island, about six miles south of New York City, and separated from the Atlantic on the southeast by a sand-bar of a few rods in width. The wind is said to change there, sometimes, twenty times in the day; a vicissitude which is decidedly prejudicial to invalids. We quote the main points in the report of Dr. Eaton:—

"The geological construction of the land in the vicinity of Fort Hamilton renders the topography remarkably singular. From the post towards Brooklyn, along the North River, the land is generally uneven, and there are numerous depressions which have the appearance of artificial excavations; they are generally four or five rods in diameter, and some of them are very deep and never dry. More than fifty, I presume, of these depressions might be counted between the post and Greenwood Cemetery, about four miles north of this. It may be readily conceived that these numerous stagnant pools, at particular seasons of the year, may affect injuriously the health of the inhabitants in the immediate vicinity.

"Eastward of Fort Hamilton, at a distance of half a mile, and extending from the sea shore to the distance of one mile northerly, and a quarter of a mile in width, is a low bog or quagmire, called by the Dutch inhabitants "dyker;" it receives the surface water from the high lands in the vicinity; and being separated from the sea by a sandy beach only, in violent storms the sea makes a fair breach over the sand, mingling the salt water with the fresh, and, there being no permanent outlet, the retained water becomes stagnant and putrid. It must be readily conceived that this is a fruitful source of disease, and in some locations in the immediate vicinity, to the leeward of the prevailing winds (S. E. almost every day in the summer) no persons can reside without exposing themselves to certain and inevitable sickness. There are other low and swampy lands in the immediate vicinity of Fort Hamilton, the more perfect drainage of which would contribute much to the health of this location."

We may observe, therefore, that, however strong the evidence adduced by Dr. E. Harris and others to show the prevalence of yellow fever in this neighbourhood to have been the result of "ship infection" from the quarantine station, there is yet enough to make out the existence of local promotive causes also; especially when it is noted that a higher temperature and greater humidity than usual prevailed there at the time of the epidemic.

At the different posts in New York harbour, eruptive fevers are said to be more common than at the other military stations; on account of their being garrisoned principally by recruits, among whom measles are not uncommon, and who are sometimes attacked with smallpox before time is afforded for vaccination. The regulations for the medical department of the army do not enjoin a uniform system of re-vaccination; they prescribe that "as soon as a recruit joins any regiment or station he shall be examined by the medical officer, and vaccinated when it is required."

Of the epidemics of cholera, influenza, &c., at Fort Columbus and elsewhere, we shall take notice hereafter.

Fort Kent, of the "North Interior" region, is the most northern post in the United States; situated on the St. John's River, in Maine. It affords an excellent example of a "Siberian" climate; the mean temperature for the year ending June, 1845, being 35.90°. The long, dreary winter commences during the last weeks of October, when repeated falls of snow cover the ground, to remain unmelted until the succeeding spring. On the 4th of June, 1844, ice one-third of an inch thick was seen. The last killing frost in 1845 took place on the 31st of May. White frosts occur repeatedly during the summer months, and the thermometer, on a clear night with a northerly wind, sinks to 34° or 33°. These frosts very seldom injure even the most tender garden vegetables. The transition from winter to summer is very sudden; the trees put forth their foliage, and the various plants spring up with singular rapidity. "I have repeatedly," says Assistant Surgeon Wotherspoon, "in the woods, found flowers in full bloom, by the side of masses of the yet unmelted snow." Occasionally, during the summer months, when southerly or southwesterly winds prevail for two or three successive days, the weather becomes very warm and oppressive, the thermometer rising to 94° or 95° in the shade; but generally it is sufficiently cool to wear the ordinary winter clothing of warm climates. The prevailing winds are from the W. and N. W. It is the southerly and easterly winds that bring the heavy rains.

Notwithstanding the rigor of their climate, the settlers on the St. John's River, mostly of French origin (descendants of the Acadians), are stated to marry at a very early age, particularly the females—as at 13 and 14 years. Some of the families are rather remarkable in point of numbers. Twelve, living within a mile of the garrison, and taken without exception, have had in all, 93 children. One man had 26 children by one wife; the mother having her last infant at 53 years. Another, had 19 children in 18 years; five pairs of twins. A third, in three successive years, had three twin births; and all of the children lived: and other remarkable instances are given. The women often leave their beds twenty-four hours after delivery; and, in consequence of this and rapid child-bearing, are most of them subject to prolapsus uteri and leucorrhœa.

In 38 cases, the average date of the first appearance of the menses was 13.5 years. In 8 American girls raised on the river, although accustomed to more comfortable living, warmer clothing, and more stimulating food, the

average was 15.12 years; so that *race*, as well as climate, has decided influence.

During the fall, winter, and spring months, the forest near the St. John's becomes peopled by a floating population of lumbermen, whose number varies from 2,000 to 3,000. After the rivers open, in April, many of these are engaged for two or three weeks in setting the logs free in the streams, with their lower limbs constantly, from sunrise to sunset, immersed in water of a very low temperature. They lie down at night, weary, without changing their clothes, by a camp-fire, or on the floor of a hut. From this exposure, chronic or subacute rheumatism often results; but, during two years of observation by Assistant Surgeon Wotherspoon, only two cases of bronchitis occurred, and none of pneumonia or pleurisy. The region of Fort Kent is considered to be one of the healthiest in the United States; fevers, and other diseases of malarious origin are unknown; and other acute diseases are not common. A marked freedom from catarrhal affections is observed. On this subject, Dr. Wotherspoon remarks:—

"This is no doubt owing in great measure to the peculiar dry bracing atmosphere of this region. While on the sea-coast, I found that catarrhal diseases originated not so much from sudden vicissitudes of temperature, as from a simultaneous change in the hygrometric condition of the atmosphere. A sudden change from a comparatively dry and warm westerly or northwesterly wind, to a cold damp air from the northeast or east, was certain to send its quota of sick to the hospital, with the various forms of catarrhal disease; while an equally sudden change from a warm southerly, to a cold northwesterly, was unattended by the same results."

The climate of Fort Kent, like that of the colder regions of northern Europe, does not seem favourable to the production of pulmonary phthisis. Dr. Wotherspoon never saw or heard of a single case among the French or American settlers. Assistant Surgeon Isaacs, while living two years at the fort, not only never saw a case in the country, but asserts that some of the inmates of the garrison, affected with suspicious symptoms, recovered from them entirely. Children in and near the garrison also enjoy the best of health, being afflicted with none of the diseases common in warmer climates.

Goitre is, however, not an uncommon complaint in the settlement; attacking, here, as elsewhere, mostly females, after the age of puberty. Twenty-five years since, it was much more prevalent than now. It is supposed by the inhabitants to originate in the use of the river water; but the same water has been freely used by those living on the lower St. John's, and yet a case of bronchocele has never been seen below the Grand Falls. It has attacked the American settlers as well as those of French origin. In one young American girl, aged 15, it appeared after she had been in the country about a year; in two others, after they had lived on the river a longer time. In two of these cases, the disease was cured by a removal from the country. In looking at the topography of this region, as described, it is difficult to see any marked peculiarity to which to refer the tendency to this disorder. The whole country is, it is true, intersected by chains of hills, running from W. to E., of a height varying from 200 to 600 feet above the level of the river; and, in the valleys between these, densely wooded, until cleared for farms, the inhabitants, no doubt, live. But the streams are rapid, and hygrometrical observations would seem to indicate that, in general, the atmosphere around Fort Kent is unusually free from aqueous vapours.

A similar salubrity, especially as regards the absence of consumption, is reported of Fort Fairfield, on the Aroostook River, 200 miles from the ocean.

And in regard to Hancock Barracks, with a mean annual temperature of 40.15°, Assistant Surgeon Sprague remarks, that

"This station surpasses most others in its freedom from sickness. Cold as the winter is, and damp as the autumn and spring are rendered by frequent rains, persons who have suffered from weak chest find their complaints much mitigated by a residence here. Consumption is rarely seen among the inhabitants of the town, and many persons, who were predisposed to that disease, have continued in good health, free from cough, and have had their constitutions invigorated and improved."

West Point, on the west bank of the Hudson, latitude 41° 23′, is well known to be a remarkably healthy spot. "From December to March, particularly in the coldest, and, of course, driest winters, it often occurs that, out of eight hundred persons, there is not, for weeks together, one seriously sick." A high ratio of reported cases of disease occurs, however, on account of the command at West Point consisting almost entirely of cadets, who are often registered for very slight indispositions.

At Watervliet Arsenal, a malignant epidemic of erysipelas, "with also many cases of puerperal fever, nearly all of which proved fatal," prevailed in June, 1841. In 1842, a similar disorder spread over the northwest part of Vermont, along the New York border, and in the counties of the latter State bordering on Lake Champlain. It reached Plattsburg by March 31st; and continued without much mitigation until the summer of 1843. In the latter place, notice is especially taken by Assistant Surgeon McPhail, of the coincidence of fatal puerperal fever with the epidemic.

In the "Region of the Great Lakes" we find, without many degrees of change of latitude, much more evidence of the prevalence of endemic diseases than in those just reviewed. At Madison Barracks, near Lake Ontario, N. Y., a question of interest is raised, by Assistant Surgeon Henderson, as to the cause of the unusual amount of sickness, chiefly diarrhœa and remittent fever, in the summer of 1839. As compared with other years, that season was "cool and seasonable as to rain." No local or hygienic difference could be discerned except that, "within a few years, the lakes have risen between three and five feet, and are *now falling*." Dr. Henderson does not consider that this laying bare of a few inches, annually, of lake shore, or the draining of tributary streams, can have much to do with the sickness. Surgeon H. L. Heiskell agrees with him, especially as "the lake shore in this vicinity is generally bold and rocky;" and suggests the *ill-ventilation* of the barracks as a cause of disease. Dr. Henderson, however, shows that although still imperfect in ventilation, the company-rooms were much better in this respect in 1839 than in 1838, when there was little sickness. More recent investigations, in New Orleans and elsewhere, would seem to prove that the popular view, in regard to the insalubrity of *newly exposed soil*, is probably correct, in pite of theoretical objections.

At Fort Ontario, in the city of Oswego, on Lake Ontario, but 50 or 60 feet above it, and 290 feet above the level of the sea, intermittent fever prevailed in 1842; since that time, it has almost entirely disappeared.

At Detroit Barracks, and at Fort Gratiot, near Lake Huron, autumnal fevers exist; being favoured, in both instances, by the neighbourhood of "sluggish streams and frequent broad marshes."

Fort Mackinac, on the island of Mackinac, 728 feet above the level of the ocean, is stated to be one of the most healthy in the United States.

At Fort Wilkins, near Copper Harbor, on Lake Superior, an epidemic of *peritonitis* occurred in the winter of 1844–45.

"Although only thirteen cases were officially reported among the soldiers, many of the command were affected with premonitory symptoms, such as nausea, weight, and oppression at the epigastrium; sometimes griping, burning pain, diarrhœa, and occasionally bloody discharges. Again, there were pricking, tearing, lancinating pains in the abdomen, with tenderness on pressure. Yet many of these cases were so checked, by promptly resorting to remedies, that, not running out their course, they were not reported; nor were some severe cases in the families of officers reported on the sick-list. One case, that of a soldier, terminated fatally. The disease was marked by great severity of symptoms, by their proneness to recur, and by unusual obstinacy and resistance to the action of remedies. The plan most effectual to arrest premonitory symptoms was, abstinence from all food, counter-irritation, sinapisms, and hot applications to the abdomen; small doses of mass. et hydrarg. cum opio, followed by cups, pediluvia, and enemata. If the disease did not *rapidly* yield, copious bleeding, followed by cupping, calomel, and opium in doses to act gently on the liver and intestinal canal, and to relieve pain, were the appropriate means. I found it necessary," says Assistant Surgeon Isaacs, "in most cases, to repeat bleeding and cupping three or four times. In the latter stages blisters were used. In the first two cases only did I think it necessary to touch the mouth with mercury, and it is questionable whether it was of any service. The disease in its last stages had a strong tendency to pass into dysentery. From the symptoms and aspects of all the cases carefully considered, and from the post-mortem developments in the one fatal case, the disease seems to have been an *obstinate and intense peritonitis;* the inflammation in the latter stages involving the mucous coat of the stomach to some extent, of the small intestines, but particularly that of the colon."

The cause of this singular affection was unknown. Endemic atmospheric agency seemed probable, as a similar form of disease prevailed at La Pointe, 180 miles west of Copper Harbor, four years before, destroying about thirty of the inhabitants. This was also in the winter.

At Fort Winnebago, in the "North Interior region, west of the Great Lakes," Surgeon Lyman Foot observes:—

"One thing I think remarkable here; complaints of the lungs, phthisis in all its forms, are less common here than at any post at which I was ever stationed. How shall we account for it? Is it the dry atmosphere?"

Of Fort Dodge, in the northwest corner of Iowa, latitude 42° 28′, Assistant Surgeon Keeney states, that—

"Most of the diseases of the respiratory system were of the mildest nature, and in the majority of the cases were unaccompanied with febrile action. The only diseases of the chest, involving the substance of the lungs or pleura, were imported cases. The mildness of the diseases of the thoracic organs may also be attributed to the general dryness of the atmosphere during the great thermometric changes."

These changes are described as being sometimes extreme; not merely rigorous from the low degree of temperature but from—

"Hurricane winds that rushed from the north and swept over the prairie, chilling the innermost blood both of man and beast. During January, 1852, the mercury fell to the lowest graduated degree of our thermometers, namely: 28° below zero."

In June, the temperature is sometimes 97° in the shade. These changes are attributed to the fact, that at the north, south, east, and west, all is one vast stretch of prairie, with no great body of water to modify the influence of the winds. During the greater part of the summer months there are no clouds to parry off the piercing rays of the sun. "The atmosphere is exceed-

ingly dry at all times." Remittent and intermittent, nevertheless, prevail at this post.

"I am prepared to state," says Assistant Surgeon Keeney, "that all the remittents and intermittents that have occurred at this post were caused by the imbibition and absorption of miasmatic poison generated by the vegetable decomposition in the bottom lands, where gardening and farming have been carried on. Nearly all the men who have been the subjects of these fevers were the ablest bodied men of the command, and, when on other duty in the uplands, enjoyed perfect immunity from those fevers; but no sooner would they be detailed for horticultural duty than they would report sick with one of these fevers."

The dryness of the atmosphere is said, notwithstanding the great vicissitudes of heat and cold, to induce a great rarity of rheumatism at this post.

Although not intending to dwell upon the Natural History or Botany of the volume before us, we may notice one curious problem for the vegetable physiologist, as it is described by Dr. Keeney:—

"There is one plant everywhere to be found on the prairie that at all times attracts the attention of the traveller, not only from its height and brightness of flowers, but because its leaves are endowed with peculiar qualities. It is the compass or polar plant (*silphium laciniatum*). It is a plant that grows from one to five feet high, rather coarse in its general aspect, and with a ferny leaf. The flower is like that of the sunflower. This plant is celebrated for the peculiar property of its leaves, pointing due north and south. Some have said the leaves do not always point north and south, but go with the wind. From many and careful observations, I can say that its polarity can be as much relied on as the magnetic needle.

"I have often seen the stock bent near to the ground by the force of the winds while the leaves were still pointing north and south.

"The magnet reveals none of its secrets, nor does dissection. But still I am inclined to think that its polarity is dependent on magnetism, influenced by the action of light on its leaves."

The following account is given, by the same writer, of a useful article of prairie diet:—

"It supplies the place of both bread and meat, and, for its remarkably nutritious qualities, ease of digestion, and for the great facilities of transportation which the compactness and small bulk of the article afford, it is well worthy the notice of the department. It is called *pemican*. It is composed of buffalo meat and buffalo tallow. The buffalo meat is first thoroughly dried in the sun, and then pounded until it is about the consistence of meal; the tallow is melted, and freed from all impurities, and then poured on the meat and well stirred—the proportions should be about equal, or a little more tallow than meat. The mixture, being well stirred, is then poured into sacks made of untanned buffalo hide, and allowed to cool; no salt is used—probably to prevent thirst. When properly made, it will be perfectly good at the expiration of a year. This article is used almost entirely by the fur traders of the Hudson Bay and American Fur Companies as their only food when travelling." "Fifteen pounds would be an ample allowance for a soldier on a twenty days' march, carrying with him, at the same time, his musket, his knapsack, and his pemican. I can conceive no other article of diet to be so invaluable to the soldier as the above, where transportation is limited, and difficult marches are to be made."

At Fort Ripley, on the Mississippi, in Minnesota, latitude 46° 10′ 30″ N., the climate is subject to great variation as well as rigor. The extremes of temperature noted are 96° in August, and —39° in January. A change of 30 or 40 degrees in a few hours is not uncommon. Here, as in northern Maine, when spring has once begun, the region seems to pass with great

rapidity from the climate of winter to that of midsummer. No miasmatic diseases originate in this locality. Dysentery has occurred to a serious extent, particularly in the summer of 1851. "Notwithstanding the absence of numerical bases, and of a sufficient number of facts upon which to found general deductions, the opinion may be ventured," writes Assistant Surgeon J. F. Head, "that the ratio of infantile viability will be found extremely low throughout Minnesota." We cannot help hoping that this is a conclusion based upon a temporary prevalence of disease, which may be essentially modified by extended observation.

In connection with Assistant Surgeon Head's Report, an interesting account of the Indian tribes of Iowa is given, as prepared by Dr. David Day. We may make this the occasion to condense some of the most important facts, of a hygienic and sanitary character, in regard to the Indians, which are scattered through this volume. Twelve of the reports, by different authors, give the results of their personal observations upon more than twenty different tribes,[1] carried in some instances through several years. We mention this, to show the authority for the positive assertions they contain; which conflict somewhat with the popular idea of the salubrity of a "state of nature," as savage life is inappropriately called.

The squaws, who do all the work, are in several places spoken of as more muscular and better developed than the men. Their child-bearing, nevertheless, is not untroubled. "Child-bearing," says Assistant Surgeon Moses, "among the Indians, is a no more easy nor less dangerous process than among other females in the same circumstances in life." "An Indian woman," writes Dr. Day, "can no more violate with impunity the obvious hygienic treatment necessary in the parturient state, than can a white woman."

"It is wrong," observes another reporter, "to suppose Indian children better capable of surviving less careful treatment in infancy than are those of the whites. The former are generally born with less vigorous constitutions than the latter. The 'hardening process' kills multitudes of them." "They *mostly die in infancy.*"

All the reporters agree in regard to the great mortality among the Indians, at all ages and under all existing circumstances; and the most melancholy part of this is, that it seems to be the contact with civilization which induces their speedy decay. The vices of the pale-face are more contagious than his refinements; his diseases more easily transferred than his remedies. The great scourges of the Indian tribes are, smallpox, syphilis, and intemperance; all borrowed from their white neighbours. Besides these, they die also rapidly of measles, cholera, pneumonia, dysentery, remittent, and intermittent fevers. Gonorrhœal ophthalmia is exceedingly common. Dr. Day's summary is as follows:—

"By comparing these results with the vital statistics of other races, we find that the ratio of mortality is much higher among these Indians (Winnebagoes) than in the white race, and considerably above that of the negro population of the United States; the rates of mortality in Great Britain being 1 death in 44 inhabitants; in Massachusetts, 1 in 35.30 (Eighth Report to the Legislature of Massachusetts relating to the registry of Births, &c.); in Philadelphia, 1 in 43.12 of the white population, and in the coloured, 1 in 31.05 (Emerson on *Vital Statistics of Philadelphia*). In Baltimore, the average ratio of mortality is, in the white population, 1 in 46.40; in the free coloured, 1 in 34.17; while

[1] Winnebagoes, Ojibways, Sioux, Osages, Pawnees, Kickapoos, Choctaws, Chickasaws, Cherokees, Creeks, Caddoes, Wakoes, Tonkiways, Witchetas, Comanches, Lipans, Navajoes, Chinooks, Clatsops, Cathalemets, &c.

in the slave population, it amounts to 1 in 26.59 (Joynes, Stat. of Mort. of Balt., *Am. Journ. of Med. Sci.*, Oct. 1850). The rate of mortality among the Winnebagoes, and that of the slave population of Baltimore, as given by Dr. Joynes (which, I believe, does not materially differ from that of the same population in other American cities), are very nearly the same." "The proportion of mortality is much greater among children than appears to exist elsewhere in childhood. In Great Britain, 35 in every 100 deaths are under 10 years of age; in Philadelphia, 56 per cent. are under 21 years; and in Baltimore, 58 per cent.; while, among these Indians, those dying under 15 years amount to 70 per cent. of the total mortality." "Cases of extreme longevity, however, are not rare among them." "This is in accordance with the fact, that that class of a population having the shortest life in the aggregate, furnishes the most cases of extreme longevity in proportion to its numbers."

In Kansas, Assistant Surgeon Barnes states the number of the Osages to have been, in 1845, 6,000; in 1850, 5,000; in, 1852, 3,500. The destruction from smallpox alone, has been sometimes tremendous; sweeping off the half, or more, of a tribe, in one epidemic. This is easily credited, when we remember, that, in Great Britain, before the time of Jenner, in a population of eight millions, the deaths, per annum, from smallpox, were thirty or forty thousand. Such facts should answer all skepticism in regard to the value of vaccination. Typhoid pneumonia, or the "winter fever," destroys the Indians, also, in great numbers; and phthisis is very common and fatal.

When an Indian is seriously sick he is almost sure to die. They have few remedies. The report of their having a cure even for the rattlesnake's bite seems to be without foundation. Venesection (without much choice as to the vein or instrument), local scarification, and the vapour-bath, are their principal means of treatment of disease. But the main reliance is always upon the conjurations of the "medicine-man." This prophet-doctor endeavours to exorcise the malady by spells and rites; if he fails, in some places at least, he forfeits his life; unless he can purchase it, with an equivalent of baubles and blankets.

Returning, now, to our inspection of the local reports, Assistant Surgeon G. K. Wood, at Fort Laramie, in Nebraska, lat. 42° 12′ 38″, makes the following remarks:—

"The climate of those broad and elevated table lands which skirt the base of the Rocky Mountains on the east, is especially beneficial to persons suffering from pulmonary disease, or with a scrofulous diathesis. This has been known to the French inhabitants of the Upper Mississippi and Missouri for many years." "The reports from the line of posts stretching from the Upper Platte through New Mexico to the Rio Grande, give a smaller proportion of cases of pulmonary disease than those from any other portion of the United States. The air in this region is almost devoid of moisture; there are no sudden changes of temperature; the depressing heats of the eastern summers are never felt; and, although in the north the winters are extremely cold, a stimulant and tonic effect is the only result of exposure in the open air. It is of great importance that the climate of this region should be generally known, that the present injudicious course of sending consumptives to the hot, low, and moist coast and islands of the Gulf of Mexico should be abandoned." "The towns of New Mexico should be selected as a refuge for those showing a tendency to disease of the lungs, or scrofula, anywhere east of the Rocky Mountains, and west of the region where 'northers' prevail."

Coming next to the "Middle Division," at Fort Washington, on the Potomac, Assistant Surgeon Edwards observes, that intermittent and remittent fevers, always endemic, have *decreased* in prevalence within a few years. The cause for this is unknown.

At Fort Monroe, on Old Point Comfort, Virginia, the terminus of the western shore of the Chesapeake, the characteristic of the climate is described as being *humidity*. In the language of Surgeon Stinnecke:—

"The existence of this altered or modified condition of local atmosphere is distinctly visible in its checking the advances of spring, by retarding the action of all physical agencies; in the development and growth of vegetation, when compared with that of surrounding districts; in the rapid and large accumulation of mould on all articles susceptible of imbibing moisture; in weakening and relaxing the animal tissues; and in exalting the impressibility of the entire system. In a practical point of view, professionally considered, the most important consequences of these peculiarities of air are the tendencies (noticed) to affect the animal tissues; tendencies manifested in the frequent induction (and obstinacy when induced) of certain of the profluvia, such as leucorrhœa and menorrhagia. Similar pathological conditions, and referable to like causes (humid air), are, we believe, noticed as pertaining to the coast of Holland."

Dr. Stinnecke also refers to the alterative properties of the "marine air" of the locality, considering that, for therapeutic effect upon invalids, the stay at such places is usually not sufficiently long. Fort Monroe, unlike the neighbouring country, is entirely free from miasmatic disease; and it is thought worthy of note, that, in four years, not a single case of any of the exanthemata has occurred; although prevailing, at times, no further off than Norfolk, distant but fifteen miles.

In the region farther west, one of the most unhealthy posts in the country is at the St. Louis Arsenal. It is at the lower end of the city of St. Louis, and nearly surrounded by shallow water, in which animal and vegetable remains often accumulate. Intermittent fever is the prevailing disease. At Jefferson Barracks, ten miles lower on the Mississippi, the same endemic exists. "At least three-fourths of the persons at the post," says Surgeon De Camp, "have had fever this season (1839); while at the distance of one mile from the river, a dense forest intervening, there has scarcely been a single case."

Forts Scott and Atkinson, in Kansas,[1] give us examples of a *prairie* country and its climate. The site of the former is particularly "open and unconfined." It is on a spur of table prairie land, about 1000 feet above the level of the ocean.

"Owing to the physical conformation of the country, the climate is one of extremes of heat and cold, of dryness and moisture. After a long and debilitating summer, the winter, most frequently commencing abruptly with cold storms from the N. E., is a succession of alternations, the mercury falling or rising 30° to 40° in a few hours." "There are no grass-ponds, swamps, or lakes near us; the streams are numerous, but without stagnant pools; the bottom-lands extensive, and sometimes overflowed, but they drain as rapidly and thoroughly as the prairies."

And yet, of 3,415 cases, in about seven years, in a command of 3,034 men, 1,717 were *malarious fevers*. We must look for the cause of this preponderance, to use the expression of Assistant Surgeon Barnes, to the "*general characteristics of rich prairie country;*" which vary, in a striking manner, with the influence of different seasons. A predominance of the *weed-growth* over that of the gramineous plants is believed by Dr. Barnes to be an important source of comparative insalubrity.

"The time of the spring rains affects the growth of these prairies much more

[1] Or, as enumerated in another part of the volume, the former in Missouri, the latter in Iowa.

than the quantity, and upon a supply of moisture at a certain period the vegetation of the year will principally depend. In an ordinarily productive and healthy season the spring rains commence in April, and do not continue beyond the middle of May; the weeds and grasses shoot up rapidly, are fully matured in July. Desiccation commences in August, and in September the horizon becomes smoky from numerous fires, which, extending, sweep off the greater portion of the year's growth. Should, however, the spring rains not set in until June or July, the weeds will have withstood the drought better than the grasses, and will then start into rank luxuriance, the prairies remain green until late in the fall, and the winter rains commence before desiccation is completed or the surface burned over. That the growth, as well as the decay of this vast amount of vegetable matter, spread over the entire region so controlled, generates a malarial influence, either by the evolution of miasma, or, as is most probable, by the development of organic germs (cryptogamous growths in such seasons being inconceivably abundant), can hardly be questioned. The epidemics of 1843, 1845, and 1851, commenced while the prairies were still clothed with verdure, and reached their acme before decomposition was established; the striking feature of resemblance in these seasons being the lateness of the spring rains." "The oldest residents of the country look to the early commencement of the spring rains as the harbinger of a healthy summer and fall, and *vice versâ*."

Dr. Barnes has noticed, also, a marked relation between the prevalence, in winter, of diseases of the respiratory organs, and the pre-existence of malarious fevers. "Among the country people, a severe winter following upon an epidemic of intermittent produces much mortality; for, either through the debilitating effect of long exposure to malarial influences, or a predisposition induced directly by them, pneumonia, pleuritis, and pleuro-pneumonia usually assume a typhoid form." This important statement is confirmed by the accounts of the fatality of the "winter fever" or "typhoid pneumonia" in many of the reports from malarious regions, as in those of Assistant Surgeons Coolidge, Glisan, Crawford, and Anderson. The following is the description of the disease given by Assistant Surgeon Coolidge, while stationed at Fort Gibson, Indian Territory:—

"The most fatal disease occurring in the vicinity of Fort Gibson, and also in the State of Arkansas, is that called, in the language of the country, 'winter fever.' The principal mortality among the Cherokee and Creek Indians is from this disease. It usually attacks persons enfeebled by climate and malarial influences, who live in open houses, are poorly clothed, and, above all, intemperate. No case has occurred, to my knowledge, among the regular troops. The disease is sometimes rapidly fatal, being ushered in with a chill, during which the brain or lungs, or both, become fatally congested, the patient never rallying. In less severe cases there is usually a chill, followed by fever, complicated with pneumonia, which is not unfrequently double. The disease has a strong tendency to become typhoid, and, if treated as an ordinary pneumonia, is generally fatal." "It appears to be an 'essential fever,' with inflammation. In such cases my observation teaches me that you may bleed, cup, give mercurial cathartics, and use the tartrate of antimony freely, and still the disease will gain ground." "In this condition, with extensive inflammation of both lungs, I have given the sulphate of quinia in ten and twenty grain doses, with the happy effect of *removing almost entirely the attendant fever* in less than twenty-four hours, and checking, or at least enabling remedies, before inefficacious, to check the progress of the disease."

In a subsequent report (March, 1847), the same writer observes:—

"I have had an excellent opportunity this quarter of treating this disease ('winter fever'), in a severe form, among the Arkansas volunteers, and the success of my treatment has corroborated the views expressed in my report for December, 1845. The treatment adopted was moderate bleeding, cupping, and

external irritants; a mercurial cathartic, followed by the nitrous powder of the *U. S. Dispensatory*, frequently repeated, and quinia given in sufficient doses to check the fever, which it always did. The disease had a typhoid tendency, which prevented large bleeding, and rendered the use of serpentaria, senega, and wine, necessary in the latter stages. Sixteen cases were treated this quarter, two of which were fatal; of these, one was apoplectic when first seen; the insensibility was never removed, the patient dying in sixty hours. The other was complicated with meningitis, and was under treatment only thirty-six hours."

At Fort Atkinson, on the Arkansas River, Assistant Surgeon Ridgely, while noticing the great comparative frequency of diseases of the digestive organs, observes that—

"This is in striking contrast with those of the respiratory organs. I can only attribute this almost entire immunity from intra-thoracic disease to the great dryness of the atmosphere which usually characterizes this portion of 'the Plains.'"

Assistant Surgeon Barnes gives us, at Fort Riley, Kansas, in 1853, an instance of vegetable decomposition occurring on a large scale during the summer, in latitude 39°, without the origination of a single case of malarial fever. After the 20th of May—

"Large quantities of timber were cut in the bottoms, leaving the ground cumbered with decaying tree-tops, branches, and foliage, without any perceptible effect on the health of the troops; the parties at work near the river being quite as free from disease as those at the quarries. The dryness and equable (although high) degree of heat during August and September, doubtless tended materially to this exemption."

We are brought, now, to the "Southern Division," between the 30th and 35th degrees of latitude. In the "South Atlantic" region, four military stations are included; of which only two are permanently occupied—Oglethorpe Barracks, at Savannah, and Fort Moultrie, on Sullivan's Island, Charleston Harbor. The following brief description is given of the topography of the former locality:—

"Savannah is distant about 12 miles, in a direct line, from the ocean. Situated upon a sandy plain, elevated about 40 feet above low-water mark, this city stands upon the southern side of the river of the same name. This ridge extends upwards of a mile along the river, terminating abruptly. At the depth of twenty or thirty feet, fine water is obtained. The city is bounded on the east and west by alluvial soil, called, in the language of the country, *tide swamp;* being subject to inundations by the ordinary spring tides. It is, consequently, well adapted to the cultivation of rice. The city, divided by numerous and wide streets intersecting each other at right angles, is open and spacious; and, being planted with the pride of India (*melia azedarach*), the long-continued heats of summer, moderated by the sea-breeze, prove less oppressive than in some more northern towns."

An elaborate report, the longest in the book, is contributed by Surgeon J. B. Porter, on the medical topography and diseases of Fort Moultrie and Sullivan's Island. It contains much matter of great interest, especially in regard to yellow fever; but the readers of this journal have been already made acquainted with its facts, through the papers by the same author, not long since published.[1] We may barely recapitulate a few of the main points insisted on. These are—1. The indigenous origin of yellow fever at that locality,

[1] Am. Journ. of Med. Sci., July and October, 1854; January, April, and July, 1855; October, 1856.

and its non-contagion. 2. The terrible increase of fatality given to yellow fever by *intemperance.* 3. The employment of *quinine,* in free doses, *with calomel* in its treatment. Ptyalism was thought to be always a favourable sign. 4. The occurrence of febrile epidemics, bearing a *more* or *less* near resemblance to yellow fever. Thus, in the fall of 1850:—

"The epidemic disease was mostly southern bilious remittent fever; sometimes continued fever, with tendency to congestion. But . . . . . I do not hesitate to say that the disease made a near approach to yellow fever." "Everything considered, it is my opinion that only 'one more turn of the screw' was wanting to develop well-marked yellow fever."

We quote this in order to compare with it one or two expressions used by other reporters. Assistant Surgeon Moses, at Ringgold Barracks, in Texas, 1854, remarks:—

"On my arrival, I found the same disease prevailing which had existed at Fort Merrill; a malarial fever of unusual severity. The disease, soon after, increased in intensity, and attacked a large majority of the garrison, and nearly every soul in the adjoining village; appearing in the different degrees from ordinary fever and ague to a low congestive form of remittent, closely approaching yellow fever. Along the banks of the Nueces and Rio Grande, few escaped between Lareda and Brownsville; while at Monterey, Saltillo, and Mier, in the interior, the disease was comparatively mild; at Corpus Christi, on the other hand, it was of greater severity, and assumed the form of *black vomit,* or true yellow fever."

Again, Assistant Surgeon Hammond, Barrancas Barracks, in Florida:—

"This case," described in the report, "affords a fine instance of yellow fever. Its subsidence through the different forms of miasmatic fever, as the cause was removed, not to say eliminated, and as circumstances permitted the latter to produce a sensible effect, is perceptible; and the peculiar influence of sulphate of quinia in malarious fevers is evident. The tendency of the fever to return in an intermittent form, was observed in many of the other cases of yellow fever that recovered."

These facts admit, of course, of explanation upon either of two theories; that of the essential identity of all southern fevers, yellow fever being only a *high grade* of bilious remittent—the view which Chervin urged, and to which Dr. Rush inclined—or, that of the blending and conversion of types of fever, which are specifically distinct; as elegantly expounded by Prof. Dickson. With the majority of the profession, we prefer the latter view; but the facts are such as ought not to be overlooked.

Cholera infantum is said to be indigenous on Sullivan's Island; and it is mentioned as an example, also, in a comparatively warm climate, of a locality quite unsuitable to patients with chronic bronchitis or phthisis; the mortality from the latter disease being high, as might be anticipated, from the "hot climate, humid atmosphere, and high dew-point."

In the accounts from the "South Interior" region, we are made familiar with the most peculiar feature of southern climates—the alternation of the dry and "rainy season." At Fort Jessup, Louisiana, "the summer usually commences about the 1st of May, and continues until the last of September." "The rainy season commonly begins in the month of February, and continues until the first or middle of May, with intermission." Malarial fevers of all types abound in this section of country; which includes the States of Georgia, Alabama, Mississippi, and Louisiana.

The attention of the profession has been often concentrated upon the city of New Orleans, on account of its fatal epidemics. We extract, from the

work before us, the following sketch of its chief atmospheric habitudes, by Surgeon Hawkins:—

"The S. W. and S. E. winds prevail during the five months from April to August, and the N. E. in September. It is to be remarked that the E. N. E. and S. E. winds come from the Gulf of Mexico, over an immense tract of low swamps, and that the prevalence of N. and E. winds in July, August and September, is always attended with the epidemic yellow fever. In fact, these three months are the only ones that can be considered as proper seasons of disease—that is, the cause of yellow fever is produced during those months. Its ravages may, and do, extend into October; but when there has been no epidemic during August and September, strangers are not as liable to disease in October. It has also been remarked, that during an epidemic—for example, in September—if the wind prevails steadily for a few days from the S. W. or W., the disease seems to be checked, fewer new cases occur, and those who are sick recover more readily. If, after this state of things, the wind shifts around again to the N. E., the disease resumes its virulence, cases occur more frequently, and those who are convalescent are suddenly thrown back and frequently succumb. The yellow fever in this climate, then, may be traced to the following combined causes: 1. Low stage of water in the river, leaving its banks, with the deposits brought from the upper country, exposed to the action of the sun; 2. Decomposition of vegetable matter in the swamps in the rear of the city; and, 3. The prevalence of E. and N. E. winds. These winds come not only loaded with miasmata from the swamps which they traverse, but are cold, and tend to produce chills, rendering the system more liable to be impressed with other causes incident to the climate, such as sudden alternations from cold showers to a burning sun. In confirmation of this opinion, it is remarked that a contrary state of things—to wit, high stage of water on the river, and the prevalence of S. W. and W. winds—is not attended with epidemic fever."

Assistant Surgeons McParlin and Hammond, amongst others, give very interesting accounts of epidemics of yellow fever—the former at Pascagoula, Mississippi, in 1853, and the latter at Barrancas Barracks, Florida, in the same year. Both of these gentlemen, and especially Dr. Hammond, state the greater liability to attacks of those brought into frequent connection with the sick; as attendants in the hospitals, &c. Says Dr. H.: "The apparent contagiousness of the disease was a subject of general remark, and not a question." Of several who have, in this volume, reported at greater or less length on yellow fever, these are the only writers who hold this opinion. We need not comment upon the possibility, so largely discussed of late, of a quite opposite construction being (by those who hold different views) honestly placed upon the very same facts; nor upon the recently urged opinion, which seems to harmonize many conflicting reasonings upon this subject and on that of cholera, that the occasional personal conveyance of the *causa causans* of disease may be rationally explained otherwise than by absolute contagion.

The gentlemen above named concur with Surgeon Porter, as to the success and comparative merits of the use of calomel and quinia, in full doses, as the main part of the treatment of yellow fever. Agreement upon this point seems to have been quite general, although not without exception, among the medical officers of the army, at the period of the preparation of these reports.

The impossibility of substituting any known remedy for sulphate of quinia (cinchonia, quinidia and quinoidine not being amongst the army supplies) in the treatment of autumnal fevers, is testified to, after compulsory trials, from deficiency of the drug, by Assistant Surgeons McCormick, Head, and Moses, in three different localities. Even Peruvian bark itself failed; and Fowler's solution, ferrocyanuret of iron, sulphate of zinc, opium, Virginia snakeroot, and common salt, had still less success. The latter, salt, was given by Dr.

Head, to 21 patients; of whom 7 recovered under its use; the average duration of these cases being $3\frac{3}{7}$ days.

Very little is said, in the reports before us, of *dengue*. The following brief account of it, as it prevailed at Fort Brown, Texas, in 1850, is given by Surgeon N. S. Jarvis:—

"More than one-half of all the cases of disease reported during the quarter were of the complaint familiarly known as the 'dengue, or break-bone fever,' which last appellation is very characteristic of one of its prominent symptoms. It appeared here as an epidemic in the early part of October, having previously travelled along the line of coast from New Orleans to Galveston, Matagorda, and Lavacca, to this place." "It continued to prevail during the whole month of November, and a few cases have occasionally made their appearance up to the present time. Few of the adult male population escaped an attack; whereas, among women and children there was a remarkable exemption. The attack rarely consisted of more than one paroxysm, lasting about twelve hours, and followed by a remission or cessation of all the symptoms that marked the approach and presence of the fever. Notwithstanding the shortness of the paroxysm, the debility that followed was very great, and it was frequently several weeks before the patient recovered his former strength and vigour."

In the reports from Florida, St. Augustine is alluded to, as at all times justly esteemed for its salubrity. It is situated upon a bay, about two miles from the ocean, and equally sheltered from extremes of inland and marine influence. During the winter, it is probable that no other city on the continent affords greater safety and advantage for a pulmonary invalid. It has been, nevertheless, occasionally invaded in the autumn by yellow fever: much more seldom, however, than the other southern cities or Key West.

In regard to the climatology of Florida, at large, some remarks are made by Assistant Surgeon Southgate, of considerable interest, which we would transfer at length, but for the want of space. He considers its conditions favourable, especially to the

"Northern invalid, whose skin has been constricted during successive hard winters, who has suffered from frequent catarrhs, and in the upper portion of whose lung the fatal deposit has been made; to him, a removal to Florida holds out the prospect of greater length of days." But, on the other hand, "for those who become consumptive in Florida, a removal to a more bracing climate is imperatively demanded. In such, the rapid melting down of the tissues of the lung during the warmer months, it has been my painful duty to witness in more than a single instance. In St. Augustine, tuberculosis of the lungs is not a rare disease. Of one family, originally numbering ten, two alone survive—eight having been hurried to the tomb by this formidable malady. Among the negro population it is not uncommon."

Dr. Southgate relates, in the same paper, remarkable examples of the direct toxic effects of local miasm—as evinced in the production not only of periodic fever, but of gastric and nervous symptoms, much intensified by particular circumstances of exposure. "The effects," says he, "were as specific as those produced by any poison; and upon such evidence the mind may repose, until the advance of science shall enable us still further to disclose the mysterious agents by which we are surrounded." Dr. S. is reminded, forcibly, by the facts alluded to, of the cryptogamic theory of the origin of fevers, so ingeniously sustained by Prof. J. K. Mitchell.

One fact is prominently brought out, not only by Dr. Southgate, but by several other reporters of the "army statistics:" namely, that no such thing as acclimatization to the miasmatic influences of our southern country is to be expected, by a non-native, after any period; but that, on the contrary, *the*

longer his residence in such a region, the greater his liability to sickness, and the greater its severity and his incapacity of resistance. This ought to have its effect, certainly, in determining the time and manner of apportionment of troops or other persons to regions which are decidedly insalubrious. Chronic diarrhœa, of a most intractable form, is one of the frequent results of long exposure to the climate of interior Florida; but a vivid picture is drawn by Dr. S., of a condition not unfamiliar to the medical reader, even at the North, as designated by the term *miasmatic cachexia.*

At Fort Pierce, 170 miles south of St. Augustine, the water used in drinking is stated by Assistant Surgeon Conrad to be impregnated with sulphuretted hydrogen. No considerable prevalence, however, of febrile diseases is there reported. In the Rio Grande, New Mexico, Assistant Surgeon Hammond has observed the same impregnation; yet at the post where this observation was made (Socorro) intermittent fever is said to be "very rare."

A description, by Assistant Surgeon Abadie, of the worst form of southern country fever, is so graphic, being drawn "from the life," that we think the quotation will not be out of place, however familiar the topic. It was a "pernicious intermittent and remittent fever," at Barrancas Barracks, Florida, in 1846.

"This disease commenced with us about the beginning of August, attacking with little apparent violence, attended from the first with great tendency to congestion of the different important organs, more generally the liver, alimentary canal, and brain. The individual attacked appeared as if poisoned; the blood being changed in its character, dissolved and unnatural in appearance when drawn, resembling the dregs of claret in water, coagulating imperfectly. Stimulation had to be used from the commencement; and when depletion had to be employed, it was practised by cups, from such parts as were the most threatened with disorganization. The treatment pursued had to be purely eclectic, meeting the symptoms as they appeared. Powerful counter-irritation to the surface by means of hot spt. terebinth. frictions, followed by the application of sinapisms, so as almost to cover the whole body with them, was indispensable, and was attended with signal benefit. The sheet-anchor of the treatment was large doses of quinine and calomel to re-establish the secretory functions, which were entirely arrested from the beginning of the attack. The dejections from the stomach, vomiting being usually present, consisted of a colourless, glairy fluid in some cases; in others, dirty green or brown flocculi were suspended in it. The discharges from the bowels presented somewhat the same appearance, being generally watery, of a dirty black colour, the more consistent portion of the stool being very fetid, falling to the bottom of the vessel in a pulverulent form. During the fever the liquor ammon. acetat. with mist. camph. and spt. nitr. dulc. was well borne and did much good. Before the termination of the paroxysm, which was usually by the most profuse cold sweats with very frequent and almost imperceptible pulses, quinine in ten grain doses was given with great benefit; the pulse becoming fuller and less frequent, the sweat more natural. The doses were repeated in intervals of from three to five hours, arresting the paroxysm if the calomel, which had been continued in repeated doses at the same time, had succeeded in restoring the suspended secretions, which was manifested by the appearance of copious bilious stools, or large dejections of a dark, tarry nature. The type of the fever was at first intermittent, generally a double tertian, the first paroxysm only being attended with slight rigors; the occurrence of the paroxysm being very irregular, mostly at night; the intermissions very short, there being none perceptible, in some cases, for the first three days of the attack. In September the fever assumed the remittent type; the septic effects of the miasmata being more striking, the congestion less susceptible of relief. In children under five years, in three cases out of five, the disease was ushered in by apoplexy or effusion on the brain, one side of the body being completely paralyzed,

whilst the other was thrown into spasmodic contractions. Fifty-six cases of the disease, including a few relapses, have been treated, occurring in the families of officers and soldiers entitled to attendance."

Fort Dallas, on the Miami River, three miles from the sea, is described by Assistant Surgeon Adkins, as having remarkable attractions of situation; and, it might be inferred, of salubrity.

We must hasten over the reports from Texas, with the mention of one or two climatic peculiarities. Rain falls every month in the year, but the greatest quantity in the month of May. Then the rivers and creeks overflow their banks, but subside during the month of June. The Nueces, says Assistant Surgeon Moses, rose *twenty-six* feet in June, 1854. Very little rain falls during the winter months. Variations in temperature are often very great and sudden; a cold norther springing up, and freezing one who, but a few moments before, may have been panting with heat. The heat is intense, and nearly continuous for nine months. Even the winters are mild, except when a norther blows.

These *northers* are the striking feature of Texan climate. They often last several days; are frequently accompanied by rain; are violent enough to cut off communication between Point Isabel, the Brazos, and the shipping; and are most common between October or November and March. The Mexicans believe that they tend to check bilious and other fevers; but Surgeon Moore considers this to be a mistake.

We should suppose, from the accounts given, that Austin, on the Colorado, was one of the most agreeable posts of this region.

In the botanical accounts of Texas, descriptions are given of the *Mesquite*, a variety of acacia, peculiar to that latitude. This tree makes greater resistance to the prairie fires than any other arborescent vegetation. It is abundant in all parts of Texas. Its height is, on the average, from 14 to 16 feet. It is invariably characteristic of rich land; having under it the mesquite grass, on which cattle fatten finely. The fruit of the tree is a slender pod, ripe in July. Horses can subsist on this pod. The leaves of the mesquite are bitter, slightly astringent, and tonic. The roots extend to a remarkable depth into the earth; sometimes 30 or 40 feet. It lives to a great age; is not adapted to building purposes, but affords the best of firewood; and admits of a beautiful polish.

At Fort McKavett, Assistant Surgeon Crawford remarks upon the fact, that in all of five cases of labor at that station, the placenta was retained from 8 to 24 hours; an occurrence which, he is informed, is not unusual in that country. Miasmatic fevers abound in many parts of Texas; yellow fever, cholera, and dengue are also mentioned in the reports.

Of New Mexico, Assistant Surgeon Langworthy observes:—

"I trust I shall not incur the charge of monstrously exaggerating the facts when I remark, that the whole territory of New Mexico is little else than a great sterile mountainous desert, not calculated for the residence of man in a state of civilization. There are oases, however, in all deserts; and New Mexico does not prove an exception to the general rule."

He adds, however, thereafter—that

"There is no country on the face of the globe, perhaps, that surpasses New Mexico for salubrity and purity of atmosphere, and general freedom from disease."

Assistant Surgeon Hammond states that he has never seen an indigenous case of phthisis pulmonalis in the country. Yet his description of the population is lamentable.

"In consequence of the altitude of the country, probably; of the impure atmosphere in their illy-ventilated habitations; of their inefficient clothing; want of cleanliness; want of exercise; scant and little varied diet; early marriages (from 11 to 14), and an inherited cachexia, they are born with feeble constitutions; cut the first incisor teeth at the end of the first year of age; walk at two years; are weaned at three years, or when the mother becomes obviously enceinte; the females menstruate at 12 and 13; the milk canines are seen standing, and the permanent molares appearing at the 17th year; at 25, they are in the 'sere and yellow leaf;' liable to be, and suffering much when they are, attacked by disease, they pass through life with lessened vitality, and rarely attain to very old age. Nature has done a great deal for them. Were they civilized and intelligent, disease would be little known among them."

In California, the hottest post in the United States is asserted by Assistant Surgeon Wirtz to exist, at Fort Yuma, on the Colorado; latitude 32° 33′ 3″. The average mean temperature for the year is 73.62°; for the summer, 89.95°, the thermometer occasionally rising to 116°, or even 124°, in the shade.

One or two etiological anomalies occur in the endemial history of the stations in California. Thus, at Monterey, a low flat plain skirts the edge of the town, in the centre of which is a lagoon, nearly half a mile in length, by one-eighth in width. Within one or two miles of the town, are two other large lagoons. During the prevalence of the high tides in the spring, the water of the bay flows into the lagoon at the edge of the town, and keeps it full; but at other seasons, particularly at the latter part of the dry season, "the waters of the lagoon recede towards the centre, leaving a good deal of vegetable matter exposed to the sun, the odour from which is far from agreeable when sufficiently near to inhale it." Yet Assistant Surgeon King has "never known a case of intermittent fever *originating at Monterey;*" although off from the coast, to the interior as far as Salinas River, a few cases occur. We may contrast this with Camp Far West; of which it is stated, that "although there are no marshes within twenty-five miles of the post, it is considered one of the most unhealthy points in the valley of Sacramento," the whole of which is sickly from June to October. Again, the hygienic state of the town of Monterey, and its Californian population, is described as of the worst kind in all respects; so that the mortality from cholera infantum, &c., is annually great. Yet epidemic cholera has never visited the place, although it has prevailed in the Sacramento Valley, at San Francisco, San José, San Luis Obispo and Santa Barbara. This exemption is, of course, unexplained.

The practice of midwifery in California, among the natives, must have been, in 1852, in a most undeveloped state; as this example of *nimia diligentia* shows:—

"It is the custom, in Monterey, when labour begins, to place the woman on a chair in the middle of the room, and a rope is fastened to the rafters above her head, which she is directed to pull. Round her abdomen, a broad towel, or rebosa, is passed, the ends crossed behind, and intrusted to assistants, who are instructed to tighten it when the abdominal tumour descends during the pain, and *belay there* (as it were) until the arrival of the next pain, when it is hauled *taut* again, so as to hold on each time to the progress made, and not permit the usual ascent of the tumour after the subsidence of the pain. With the same view a strong man is frequently seated behind the woman, who, with his hands placed on her abdomen, makes strong pressure downwards, at each pain, with the idea of assisting, by mechanical force, the contractions of the uterus. All this time the midwife (generally some old woman) is seated in front with one, and if possible both hands in the vagina, making all the trac-

tion in her power." "These violent measures often prove fatal to both mother and child."

The diseases peculiar to women are, naturally, most common in such a locality.

Assistant Surgeon King asserts his belief that, in all parts of California, a marked tendency exists to diseases of the *brain*. Insanity is unusually frequent, to a degree not (in his opinion) accounted for by the psychical characteristics of the society and circumstances of the country.

The last of the divisions reported from, in this volume, is that of Oregon and Washington Territories. These comprise the farthest west of all the stations on the continent.

Of Astoria, latitude 46° 11′, ten miles from the Pacific, Assistant Surgeon Moses writes: "The most noticeable feature in the climate is its equability. The summers are cool, dry, and healthy; the winters stormy, rainy, and disagreeable, but mild." No endemic diseases exist, and the troops enjoy unusual health throughout the year. Yet it is described as having no attractions as a place of residence; the long, cheerless winter, and short, dry summer, with a very often foggy or smoky atmosphere, rendering the days of balmy weather few, although, when they come, delightful. The division of the year into the two seasons, rainy and dry, is remarked by Assistant Surgeon Haden as being about as constant there as in more southern latitudes.

At Astoria, Fort Dalles, and Fort Steilacoom, no indigenous fevers are reported; and their occurrence is not mentioned in any of the other reports from Oregon and Washington Territories. We may observe, in connection with this interesting fact, that, according to the statements of Assistant Surgeons Moses and Haden, *no poisonous reptiles*, or annoying insects, exist in the same regions. Can the opinion of Copland be correct, that some association exists between the number of venomous creatures and the insalubrity of a country? Looking back to the other papers in this volume, from various regions, we may find enough to make out a plausible case in the affirmative, at least as regards poisonous reptiles. In all of the numerous reports, from all parts of the continent, when any mention is made of the existence of venomous serpents in a locality, miasmatic fevers are also found to exist there; with one or two partial and incomplete exceptions only. Where a total absence of malarious fevers is mentioned, in some instances, as (besides those of Oregon and Washington), at Forts Gaines and Ridgely, Minnesota, allusion is made also to the absence of venomous serpents; in others, as at Fort Conrad, New Mexico, reptiles are not named at all. The nearest approach to an exception to this *coincidence* is in the case of Fort Defiance, New Mexico, where Assistant Surgeon White speaks of the existence of "various species of lacerta and crotallus," and also asserts that "the several cases of intermittent fever were among recruits who had been much affected with it previously on the plains, or in the States." Near Monterey, California, "rattle and other snakes" are said to be found; but, although miasmatic fevers are said not to originate *at* Monterey, they occur "off from the coast, as far interior as the Salinas River." In several of the reports, allusion is made to the abundance of *cryptogamic plants* in the miasmatic, and their rarity in the non-malarial regions.

We had intended to abstract some of the information given in this volume in regard to the prevalence of *Cholera* at the different stations; but the want of space, and the frequency with which the subject has been under discussion in this and other journals, may excuse the omission of details. Cholera occurred at many of the posts, and in their vicinity, in 1849; less extensively

in 1850, 1851, 1852, and 1854. No account of cholera at any of the U. S. forts is recorded in 1853.[1] The history of the epidemic was that of its occurrence elsewhere; often approximating the main routes of human intercourse, but not exclusively, nor with regularity; scarcely ever manifesting that direct coincidence with individual migration and proximity, which alone could suggest the idea of contagion. The preference of its effective cause for regions in which organic decomposition, especially animal, was rife, was apparent; in some instances, *miasmatic* localities seemed to be especially marked for visitation.

On board the steamship Ohio, in July, 1852, near the Isthmus, *en route* for California, cholera having prevailed, but subsiding, it appeared (in the view of Assistant Surgeon Tripler) to be re-lighted by taking on board "about a dozen knapsacks that had been lying and moulding somewhere on the Isthmus for a long time;" those men being first attacked who opened the knapsacks for a change of clothing. The *modus operandi* of this would seem to be, by the influence of putrefaction as an exciting or promotive cause.

No new symptom is mentioned in any of the cases reported, except the occurrence, in an epidemic near Lavacca, Texas (as mentioned by Surgeon Madison Mills, in Dec. 1848), of *swelling*, and sometimes *paralysis of the tongue*. This symptom is said to have there occurred in "a great many cases." Nor is there, in the treatment employed or proposed by the army surgeons, any measure so novel as to require present observation.

One of the most remarkable epidemics, as to extent, recorded in the volume, was that of *Influenza*, which prevailed in the summer of 1843. This is noted in the reports from all the regions of the United States, exclusive of Florida, Texas, California, New Mexico, Oregon, and Washington Territories. It occurred on the coast of New England, in New York harbour, East and West, and on the shores of the great Lakes, in the Middle Atlantic and Middle Interior regions, and in the South Atlantic and South Interior as far as Baton Rouge. In the whole sixteen years no epidemic of catarrh is mentioned besides that of 1843, except at Las Vegas, in New Mexico, in 1849.

The description of this disease, as given by Surgeon Porter, at Fort Trumbull, Connecticut, may interest the reader:—

"*Symptoms.*—General pain or soreness; almost invariably pains of the frontal region and loins, and frequently of the chest and epigastrium; very generally soreness of the globe of the eye; pulse varying in frequency, but almost always wanting in volume; sometimes cough quite troublesome, and often little or none; skin never hot and dry, but generally inclined to be cold and moist—amounting, in some instances, to a cold perspiration; in many cases thirst, in others none at all; and in all constipation. The disease was attended with considerable depression of the nervous power, and great derangement of the liver."

In several of the more remote positions, *scorbutus* has repeatedly occurred, from deficiencies of diet. Several remedies have been employed for this disease in the army, which are probably not yet equally familiar in civil practice. These are, the use of *wild onions* as a diet, mentioned by Assistant Surgeon Glisan, while west of Arkansas, in the Indian Territory; that of the expressed juice of the cooked leaves of the *maguey*, or *agave Americana*, as suggested by Assistant Surgeon Perin, Texas; the juice of the leaves of the *cactus opuntia*, or prickly pear; the *phytolacca decandra;* and the *fedia*

[1] In the *Consolidated Abstract*, however, 186 cases and 94 deaths are said to have taken place in that year.

radiata, or wild lamb lettuce. One writer mentions the successful administration, in several cases, of cream of tartar in small doses, long continued. Nitrate of potassa did not meet with general favour. Several of the reporters speak of the *agave Americana* as a remedy, in the highest terms of commendation. The dose of the expressed juice is from two to eight ounces, thrice daily.

At the termination of the first part of the volume, its editor, Assistant Surgeon Coolidge, recapitulates those deductions in regard to *phthisis* which have been already cursorily alluded to. By examination of the consolidated table given, it is found that, with the exception of West Point, the lowest ratio of *cases* occurs in New Mexico, being only 1.3 per 1,000; and the highest in the South Atlantic Region, where it is 9.2 per 1,000. This agrees with the previous statements of Dr. Forry, based upon similar data; with those drawn from statistics of the British army; and with those of Alexander Keith Johnson,[1] inferred from a still wider examination of medical geography.

The conclusions of Dr. Coolidge are the following:—

"*First.* That temperature, considered by itself, does not exert that marked controlling influence upon the development or progress of phthisis which has been attributed to it."

"*Second.* That the most important atmospherical condition for a consumptive is DRYNESS."

"*Third.* That next to DRYNESS in importance is an EQUABLE temperature—a temperature uniform for long periods, and not disturbed by sudden or frequent changes. An uniformly *low* temperature is much to be preferred to an uniformly *high* temperature. The worst possible climate for a consumptive is one with long-continued high temperature and a high dew-point."[2]

These are important conclusions; but no one, of course, would jump from them to the supposition, that, in the management of phthisis, it is an error to send patients to *winter* in the *South*. An artificial climate, obtained by migration, so as to avoid all extremes, will afford the greatest advantage; and we cannot suppose anything to meet this indication better than to send the patient, or valetudinarian, to St. Augustine for the winter months, and to Newport, R. I., for the summer.

An especial subject of inquiry, by circular, amongst the medical officers of the army, in 1843, was that of the effects of the *administration of quinine in large doses*, in intermittent, remittent, and congestive fevers. The Surgeon General thus introduces the topic in the appendix:—

"The prominent medical feature of the Florida war was the introduction into the army of the practice of giving *quinia in large doses*, during the intermission of intermittent, and remission of remittent fever; and, also, of the exhibition of that remedy in the febrile stage of those diseases. Without attempting to decide upon the *originality* of this practice, in *any of its phases*, or to determine to whom, among the medical officers, is due the merit of introducing it into the army (for on this point the official records are silent), it may with truth be said

[1] On the Geographical Distribution of Health and Disease. Edinburgh and London, 1856.

[2] "Consumption is rare in the Arctic regions, in Siberia, Iceland, the Faroe Islands, the Orkneys, Shetlands, and Hebrides. And, in confirmation of the opinion that it decreases with decrease of temperature, Fuchs shows, from extensive data, that in Northern Europe it is most prevalent at the level of the sea, and that it decreases with elevation to a certain point. At Marseilles, Oldenburg, and Hamburg, near the sea-board, the mortality from this cause is about 25 per cent.; at Eschwege, 496 feet above the sea, it is only 12 per cent.; and at Brotterode, 1800 feet above the sea, only 0.9 per cent."—*A. K. Johnston, op. citat.*, p. 121.

that to the medical staff of the army belongs the credit of having demonstrated, on an extensive scale, its safety and efficacy, and of having thereby largely contributed to revolutionize the treatment of fever in this country."

The earliest reports on the subject were those of Assistant Surgeon (now Surgeon) J. J. B. Wright, and Assistant Surgeon (now Surgeon) Chas. McCormick, both in 1841. The remainder of those with which the Appendix is occupied were given in answer to the circular of Surgeon General Lawson; comprising twenty-five special reports,[1] a selection from fifty-seven returned, on the following points: 1. The extent of the experience of each. 2. The purity and source of the medicine used. 3. In what doses, as regards *extreme* and *average* quantity. 4. The diseases, and states of system in which quinia was employed in large doses, and the corresponding effects. 5. The inferred *modus operandi;* whether quinine be a tonic, a sedative, or a stimulant. 6. Whether quinine has exhibited any tendency to increase the prevalence of diarrhœa and dysentery, or of affections of the liver and spleen; or whether these should all be referred to climatic influences.

There does not appear to have been *entire* unanimity, notwithstanding the very general agreement, among the authors of these reports. Their experience was ample; the article employed was, probably, pure, being nearly all supplied by the medical purveyors of the army. Neuralgia, as well as intermittent, remittent, and congestive fevers, was treated with success by *quininization.* But one of the reporters is decidedly *opposed* to the use of large doses of quinia, never giving more than 25 grains in a single interval. Dr. McCormick has given the maximum doses, 360 *grains in* 12 *hours;* "with the most beneficial result." Many, however, object to its employment during the active febrile stage, as unnecessary, at least, if not injurious; and Dr. McCormick himself, as well as many others, find the large doses *only necessary in the severely congestive* (adynamic) types of miasmatic fever, giving but from 10 to 20 grains, in one, two, or more doses, in the intermission of ordinary intermittent fever. The average dose in the "congestive" cases is about 20 grains, usually given with calomel. The names "tonic," "sedative," "stimulant," do not seem to satisfy a majority of the writers. They state that the action of quinia is *peculiar;* exhibiting, in different cases and conditions, results which might be called sedative, tonic, or stimulant in turn, and yet are accounted for by neither of these terms. In view of the objection commonly made to the use of the word *antidote* (which most simply covers the ground), perhaps the safest expression is that of Surgeon B. M. Byrne, who designates its influence, with regard to miasmatic diseases, as that of a powerful *counter-impression;* the required power of which must vary with the intensity of the morbid cause to be counteracted; a principle of proportion elsewhere illustrated in medicine, as in the case of opium in tetanus, emetics in croup, &c. &c. That so powerful an agent can "do no wrong," would seem to be incredible. Several of the writers of these reports testify that it *can,* in disproportionate doses.

The best summary statement, avoiding both Scylla and Charybdis, is, perhaps, to be found in the paper of Assistant Surgeon John Byrne; with a few words from which we may take leave of this subject:—

"The diseases of settlers in Florida from the north assume a more inflamma-

[1] From Surgeon B. F. Harney, Surg. R. S. Satterlee, Surg. R. C. Wood, Surg. B. Randall, Ass. Surg. (Surgeon) J. J. B. Wright, Ass. Surg. (Surgeon) B. M. Byrne, Ass. Surg. (Surgeon) C. McCormick, Ass. Surg. J. H. Bailey, Ass. Surg. D. C. De Leon, Ass. Surg. T. C. Madison, Ass. Surg. R. F. Simpson, Ass. Surg. J. Byrne.

tory form during the first year of their residence in the south than they do subsequently. This remark is particularly true of fevers. Hence, in fevers arising in such subjects, due attention must be paid to the employment of antiphlogistic measures previous to the use of quinia." Several of the reporters confirm this statement as to the important effect of long residence in a hot and malarious climate in relaxing the system, and lowering the type of morbid as well as healthy action. 'This may account for some of the discrepancies in the opinions entertained in reference to the effects of quinia.' In the *middle of the paroxysm* of remittents of rather a low type, Dr. Byrne found that quinia '*did not aggravate* the disease, although it *did not alleviate it;*' and he alleges that the subsidence of fever after a certain duration is so natural a phenomenon in remittent and intermittent, that the large doses of quinia may have sometimes incorrectly received the credit of producing the change.

"To sum up, I think that quinia should not be used in the open inflammatory stage of any fever, no matter how long this stage may last; that it is *particularly* efficacious in the treatment of malarious fevers only, and when some intermission, or pretty fair remission, can be obtained; that it may be given in large doses, if administered under proper circumstances, with as much impunity as in small ones; that it is generally a matter of no consequence in what doses it is administered in simple intermittents and remittents, provided from ten to twenty grains are given within a certain period of the expected paroxysm; that the large doses possess advantages in some few cases of remittents and intermittents; that in congestive fevers, large doses are of great importance, and often cannot be replaced without danger by small ones; that quinia should be used with a view to its anti-periodic effects and its specific influence in cases of malarious poisoning, and not merely as a tonic, &c.; and, finally, that if judiciously used, it may be given freely and in large doses without producing disease of the abdominal viscera."

We have no space left for the consideration, at present, of the copious and interesting Tables, of disease, mortality, meteorology, &c., which form a sort of vertebral column to this book. They all do great credit to the industry of the officers engaged in their elaboration; and will afford much valuable material for the sanitary statistician. The following is the brief summary of Dr. Coolidge:—

"The average annual proportion of cases of disease to the numerical strength of the army is 2.92 to 1; the corresponding ratio of deaths is 1 in 33.35, or 2.99 per cent.; and the proportion of deaths to cases is 1 in 97, or 1.02 per cent. Exclusive of cholera, the deaths were 1 in 38.64, or 2.58 per cent. It is probable that even this last, is greater than the actual annual ratio of mortality, as the excess of deaths in 1849 is in part attributable to diseases contracted during the war."

The highest ratio of mortality, for the sixteen years, was found to be on the southern frontier of Texas, and at the Jefferson Barracks and St. Louis Arsenal, Missouri; the lowest, at West Point, and on the coast of New England. The total number of deaths from disease, in the army, during the period named, was 3,617.

Besides all that we have alluded to, this volume contains "Statistics of the War with Mexico," and "Statistics of the Recruiting Service." These must be passed over altogether for the present. The Surgeon-General remarks, at the close, that

"It is due to the medical staff, as a body, to state that this and other reports which have emanated from the Medical Bureau, by no means fully represent the extent of their contributions to science. Within a few years past, the medical officers have been called upon to co-operate with the Smithsonian Institution, in collecting specimens of the fauna of this country, and the surgeon general takes pleasure in being able to state that the museum of that institu-

tion has been materially extended and enriched by their voluntary contributions. They have also been invited to aid Professor Ehrenberg in his work on '*Fluvial Deposits*,' by collecting specimens of mud and silt from the banks and beds of rivers; and to assist Professor Agassiz in obtaining specimens of fish, particularly from New Mexico, California, and Oregon. The responses to these invitations have been such as to elicit the acknowledgments and thanks of those learned professors."

We have taken the more interest in presenting a sketch of the contents of this valuable work, because it shows *how much can be done* in the collection of medical statistics. No one will pretend to deny, that Etiology must depend, for an accurate foundation, upon such definite facts as are thus collated, upon a large scale; nor can much less be averred of Pathology and Therapeutics. If we desire that our art shall really and essentially progress, it is high time that similar results should, by the zeal of medical men, be obtained, in civil practice, to those which the army medical staff has presented. No better field for this is afforded, in the whole world, than in our own country; and the organization of the American Medical Association makes it more than possible.

If the opportunity be, through indolence or indifference, neglected, it must be to the detriment of our profession. If embraced, it will much enhance its glory; and Medicine, disrobed, at last, of the cloud-like obscurity which has surrounded her, may, hereafter, walk among her sister sciences, co-equal with them in power, as in dignity surpassed by none. H. H.

ART. XI.—*Traité Thérapeutique du Quinquina et de ses Préparations.* Par P. BRIQUET, Médecin à l'Hôpital de La Charité, &c. &c. Deuxième édition. Paris, 1855.

Therapeutical Treatise on Cinchona and its Preparations. By P. BRIQUET, Physician of La Charité, &c. &c. Second edition. Paris, 1855.

NUMEROUS have been the works upon the subject of Cinchona. No other article of the materia medica has been more copiously written upon, and well may the history of it, in its full extent, embracing all that pertains to its natural origin and varieties, the pharmaceutical treatment of it and its application to the cure of disease, be termed Quinology. The attention and interest elicited by Cinchona from the time of its first discovery to the present have not abated, and have arisen, from the romance which may be said to be attached to its introduction, from the almost unique curative powers detected in it, and, subsequently, from its furnishing the material for opening a new chapter in organic chemistry, for which so great a debt of gratitude is due to chemistry by practical medicine.

The mode of its discovery is still, and will, probably, be unknown. Whether a knowledge of it was derived from the natives of South America, or is due to the acumen of the Jesuits, whose name for so long a period it bore, has ceased to be matter of speculation. There is no doubt that the Jesuits introduced this valuable article, and in so doing threw an apple of temporary discord into the medical world, exciting as much discussion and angry disputation as did the doctrinal tenets that at the same period convulsed the religious. Dr. Sigmond, in his interesting lectures, has remarked that the treatises on

Cinchona are more numerous than could be read in a lifetime; and Bergen, who is the author of one of the most noted and authoritative works upon the subject, modestly entitled "An Attempt towards a Monograph of the Barks," gives a list of six hundred and thirty-two authors whom he had consulted, and of eight hundred and eight books and pamphlets which had been published, and this did not include the whole number.

It is not our purpose to enter into a disquisition with respect to the early litigation originating from the introduction of this valuable medicine, in which priests and laymen, courtiers and physicians engaged with a party rancour as virulent as it was futile. It was left for such men as Sydenham and the English observers, Torti and his Italian school, and, finally, the author under consideration, to calmly and dispassionately unfold its true value by analytical observation of its effects.

It is with no fear of contradiction that we state the work of M. Briquet to be the most complete and satisfactory that has yet appeared with respect to the action of bark or its preparations upon the economy. His observations have been made in the only true way, the examination of their effects upon the different organs and general systems, and as they are modified by the circumstances which have a controlling influence over them, from which can be deduced their proper estimation and application as curative agents, and the correct methods of exhibition. The work was presented to the Academy of Sciences for the prize of medicine and surgery for the year 1854.

In the report of the commission of that body, consisting of the most learned and skilful of the Parisian physicians, it is remarked that—

"The treatise of M. Briquet upon Cinchona is one of the most important works they have had to examine; from its extent, its precision, and, frequently, the novelty of the researches it contains, it ought certainly to contribute to render our knowledge more positive and more complete as well upon the physiological action of this important medicine as upon its therapeutic action."

To present to the physicians of this country an exposition of M. Briquet's results in their varied and numerous phases, the present review has been undertaken, with the conviction that the materials afforded by his pages are of the most interesting character, and must attract attention. It may be stated here at the outset that it will be impossible to embrace in the review the whole field presented in M. Briquet's treatise. All that can be accomplished will be to give an idea of the extent of his labours, and a full account of the physiological results arrived at by him; the portion most interesting at the present time from its novelty and completeness.

The introduction is devoted to a general survey of the natural history and commercial details of bark, as well as to a condensed account of its introduction. In this there is nothing that cannot be found in the comprehensive works which treat of the subject. The same information may be derived from the *U. S. Dispensatory* or *Pereira's Materia Medica*. The medical part of the introduction consists of a sketch of the opinions entertained of it as a therapeutic agent, from the time of its discovery, of the authorities through whose instrumentality it has advanced in public estimation, and the reasons which led the author to enter upon this field of exploration. Upon these it is not necessary to dwell at present, as the matter presented will be interwoven with the subsequent details of M. Briquet's researches.

In the language of the author the

"Work includes two kinds of researches, the one purely experimental, which have as their aim the study of the direct effects of Cinchona in large doses upon sound animals; the other deductions from pathological conditions attendant

upon six hundred subjects affected with rheumatism, typhoid fever, intermittent fever, or other diseases treated by sulphate of quinine in different doses."

And further he remarks, the analysis of the particular phenomena which are produced during the administration of these large doses leads to the precise determination of the *nature of the power* of bark, and also gives the key to the mode of action of this substance in diseases for which it is generally given in small doses; and, finally, presents the only exact means of determining the value of the diverse medicinal forms under which it is exhibited, and the force of absorption from the various surfaces of the body.

The *first part* contains researches upon the action of the several principles of cinchona upon the principal organs and systems, and upon the fluids of the body.

The *second part* comprises, 1, all that has relation to the absorption of these substances, and their elimination from the economy; 2, the examination of the different circumstances which can influence this double operation; 3, the study of the diverse influences susceptible of changing the action in the organs of the portion of these substances which may be absorbed.

The *third part* is devoted to the therapeutic application of the article and its preparations.

The *fourth part* is occupied with the pharmaceutic treatment, the value of the preparations, the doses, the forms best adapted for penetration into the economy, and the surfaces best adapted to this purpose.

Part First. *Study of the action of cinchona upon the different organisms of the animal economy.*—Different views have been entertained with respect to the mode in which bark produces its effects, taking their complexion from the preconceived ideas of their promulgators, or the peculiar physiological tenets which held sway for the time. The first attempt to determine the modus operandi was made by Torti, in 1700, and was directed to the duodenum, where the febrile principle was supposed to reside. The fluids of the stomach and duodenum were submitted to the action of decoction of bark. Friend, in 1775, experimented in the same way upon the blood; and Hales conceiving that the styptic property was the medicinal one, studied it with reference to this impression. Pringle and Mackbride recognized in it an antiseptic property. All of these depended upon the chemical reaction which the ingredients of cinchona were capable of producing either with the secretions, the blood, or the tissues in a live or dead condition, and hinged principally upon the presence of tannin. Upon the discovery of the alkaloids, Magendie led the way in a more profitable experimentation by injecting the sulphate of quinia into the vessels of animals. He came to the conclusion it was innocuous; his quantities were not very great, however, and his experiments have been regarded as too general. At this epoch the doctrines of Broussais were in full sway, by whom bark and its preparations were regarded as stimulants, and the sulphate of quinia as incendiary. In this light Duval and Beraudi regarded the article. Long after, and in accordance with the prevalent medical ideas of Italy, Professor Giacomini of Padua published a series of experiments which he had instituted for the purpose of proving the hyposthenic properties of the sulphate of quinia, but the results were invalidated by the manner of performing the experiments, the exhibition of the salt being followed by alcohol or prussic acid to antagonize its action or aid in it. From these experiments only one thing is proved, that the salt mentioned is possessed of toxicological properties, and we have given to the medical world the first intimation of the cerebro-nervous effects, now fully recognized. Lately, Dr. Melier, under the impression that the toxicological properties of

the salts of quinia had not been sufficiently studied in the work of Giacomini, and instigated further by the application made of these articles in the treatment of different acute diseases, undertook, after the method of Magendie, to experiment upon dogs, and found that agitation of the frame, dilatation of the pupils, gradual weakness, and sometimes convulsive movements were the result. Upon examination, the blood appeared liquefied or the serum sanguinolent, and badly separating from the coagulum, with deep congestion of the lungs and mucous membrane. This series of experiments proved nothing more than those of Giacomini, with the exception of the liquefaction of the blood. In the pathological results the only difference consists in the state of the mucous membrane of the alimentary canal; by the Italian experimenter this portion of the body is represented as normal; by the Frenchman, as deeply congested. The probability is the theoretical views of each influenced their mode of conclusion, the first being a contra-stimulist and the latter a Broussaisist. Still later, M. Monneret published the results of some experiments to determine how far the sulphate of quinia could be borne without danger, and came to the conclusion that Dr. Melier had exaggerated the danger arising from large doses. This was the state of our knowledge of the action of the salts of cinchona, when, first in 1842, M. Briquet commenced his researches.

Action on the Circulation.—It is known that cinchona has always been regarded as possessing the property of augmenting the energy of the heart, of increasing the force of the pulse and its frequency, and of rendering the blood more plastic. This is the result of the administration of the bark itself or its alkaloids in very moderate doses. It is a physiological mode of operation. But if, in place of small, it is administered in large doses, and especially if the alkaloids are given, things are changed, and if attentively observed, three notable modifications are presented in the circulation, the first bearing upon the *frequency* of the pulse, the second upon its *force*, and the third upon the *blood* itself. The salt to which the first attention is given is of

Quinia.—From this alkaloid or its salts the preceding results are habitually induced.

Modification in the frequency of the pulse.—The effect of reducing the pulse in frequency has been noticed by many practical men when the sulphate of quinia was given. It was a result known to and reported by Giacomini, Guersant, Favier, Bailly and Banquier, Silvy, Lembert, and others. M. Briquet reports the result of his observations. The first cases reported by him were labouring under *chronic rheumatism;* 19 of these cases were treated with from 3 to 5 grammes[1] of the salt per diem. Of these, 13 evinced a decided reduction of the pulse, varying from 5 to 25 beats per minute, as follows:—

In 5 cases	a reduction of	5	beats.
2 "	"	7	"
1 case	"	10	"
1 "	"	13	"
1 "	"	14	"
1 "	"	15	"
1 "	"	21	"
1 "	"	25	"

In the 6 remaining cases 2 presented a more elevated state of the pulse, and 4 little or no change of it.

The next series of cases were those of *acute articular rheumatism;* 20 cases

[1] The gramme contains 15.4340 grains. For the conversion of French weights into the English standard, we would refer to the table in the U. S. Dispensatory.

of the disease were treated with 5 or 6 grammes per diem. Of which, the *average pulse* in 6 was above 100; in 11, 90; and in 3, 60 per minute.

At the end of the *first day* the average reduction was 18½. *Two thirds* of the cases manifested this reduction, and *one-third* no change. At the *end of the second day* the reduction averaged 22 per minute. The diminution occurred in 19 cases. The average standard of the pulse was 70½. At the *end of the third day*, the average reduction was 26. On *the fourth day*, average reduction 28, average of the pulse 62. In none of the cases was there exaltation of frequency.

Of those whose pulse was from 60 to 69, the average reduction was 12; from 70 to 99 it was above 24, and above 100 it was 42. Upon going out of the hospital the cases presented a pulse of 65, which gave a difference of 25 pulsations in the minute from the initial pulse.

Nine cases were treated with 4 *grammes* of the sulphate of quinia daily. The mean pulse of these was 85½, a third of the cases having the pulse above 100, and one case at 60. After the *first* day the mean diminution of the pulse was 14½. In no case was there an increase, and three-fourths were impressed by the medicine. After the *second* day the diminution was 22. No augmentation, and seven-eighths were impressed. On the *third* day the diminution was 24 pulsations. Augmentation occurred in one. On the *fourth* day the diminution was 21, and the average pulse was 66. Of these nine cases, the one with 60 pulsations at the commencement underwent an increase of 5. In those from 70 to 90 pulsations per minute there was a decrease of 15, and in those of 100 and upwards 42 pulsations. On leaving the hospital the average pulse was 62½, giving a difference from the initial pulse of 25.

Twenty-eight cases were treated with 3 *grammes* of sulphate of quinia daily. The mean pulse was 80. One case presented the pulse 60. A fourth part had the pulse above 100. After the *first* day the mean diminution of the pulse was 10. In 4 cases there was an augmentation of the pulse; in ⅔ there was diminution. On the *second* day mean diminution of the pulse was 15. In only two was there augmentation in frequency. In ⅚ there was diminution; mean pulse, 73. *Third* day diminution 20; still augmentation in 2 cases. *Fourth* day diminution 22½; augmentation in 3 cases, and a diminution in ⅘ of the cases; mean pulse, 66½. Of these 28 cases there was a reduction of 3 in those having the initial pulse from 60 to 69; of 19 in those from 70 to 99; and of 40 in those from 100 and upwards. The mean pulse upon going out was 60½, giving a difference of 28 pulsations from the initial pulse.

Forty-five cases were treated with 20 to 25 *decigrammes* of sulphate of quinia; mean pulse, 91; 1/15 of the cases had a pulse of 60; ¼ had it 100 and above. After the *first* day the mean reduction was 11; 4 had an augmentation; ⅔ had diminution. *Second* day mean diminution, 14; 2 cases had pulse augmented. In ¾ there was reduction; mean pulse, 73. *Third* day, mean diminution 17; augmentation in 2, and diminution in 10/11. *Fourth* day, mean diminution 19; augmentation, 1; mean pulse, 64. Of these 45 cases the diminution was 5 in those whose initial pulse was 60 to 69, 18 in those from 70 to 99, and 34 in those of 100 and upwards.

Twenty-nine cases were treated with from 10 to 15 *decigrammes* daily; mean initial pulse, 91½; 1/29 had the pulse 60, and ⅛ had it 100 and upwards. After the *first* day mean diminution, 14; augmentation in 1, and diminution in 8/9. *Second* day, mean diminution 17; augmentation in frequency in 2, and a diminution in 5/6; mean pulse, 76⅓. *Third* day, mean diminution, 23;

augmentation in 2; diminution in $\frac{9}{10}$. *Fourth* day, mean diminution, 25; augmentation in 3 cases; diminution in $\frac{1}{4}$; mean pulse 70. Of these cases there was a reduction of 2 per minute in those having the pulse from 60 to 69, 24 in those from 70 to 99, and 38 in those of 100 and upwards. Upon leaving, the mean pulse was 68, giving a difference of 23 on the initial pulse.

Similar results were arrived at when the patients were treated with the sulphate of quinia in combination with the acetate of morphia, and when the sulphate of quinia was exhibited after sanguine evacuations.

Without reference to the impression upon the disease, but simply to that upon the pulse, M. Briquet thus sums up the facts presented to him:—

"Of *one hundred and seventy-one* patients of every age, sex, and condition attacked with articular inflammatory rheumatism of diverse intensity, and treated before their entrance into the hospital by different methods, medication by sulphate of quinia, in large doses, produced diminution in the frequency of the pulse in 120 cases on the *first* day of treatment; in 144 on the *second* day, and in 155 on the *third* day. This reduction was from 7 to 18 pulsations for the *first;* 12 to 22 for the *second*, and 13 to 26 for the *third* day. It was as much more, considerable, as the dose was large. Thus, with doses of 5 grammes there was on the *third* day a mean reduction of 25 pulsations; with 4 grammes, of 24; with 3 grammes, of 20; with 2 grammes, of 17, and with 1 gramme, of 4 pulsations. Finally, the reduction has been, other things being equal, constantly proportional to the antecedent frequency of the pulse."

The latter is evident from the inspection of the foregoing specifications which have been given.

Effect upon the pulse in typhoid fever.—The patients treated at the Hospital Cochin, in 1842, by MM. Blache and Briquet, were 42 in number. They found, 1st, that the pulse underwent a reduction in $\frac{4}{5}$ of the cases; 2dly, that in 4 light cases, treated by 2 grammes per diem, the pulse, which was 100 before the employment of the medicine, fell to 80; 3dly, that in 19 cases, where the disease of the gravest type was treated with doses of from 2 to 4 grammes, the pulse, having been before the exhibition at a mean of 96, to the extremes of 120 to 85, fell in 18 of them, after two days, to 78, with extremes of 96 to 60, and at the end of 5 or 6 days to 65 pulsations in half the cases, and to 75 in the other half; 4thly, that in 11 cases of great severity, treated with 3 and 4 grammes daily, the mean pulse before the treatment being 98, with the extremes of 125 to 68, fell, at the end of 2 days, to 75, with the extremes of 90 to 60; and 5thly, that in 8 patients who died, the average pulse being 104, fell the next day after the administration of 3 to 5 grammes to 82, and the third and fourth days to 71¼. It resumed more slowly its frequency in proportion as the fatal termination was near.

It is seen from these results, that in typhoid fever, as in rheumatism, the diminution of the number of the pulsations has always been as much more considerable as the pulse was antecedently more frequent. There is a difference, however, observable between the two diseases. In both of the affections the circulation does not remain in the same way under the influence of the medicine through the whole course of the affection. In the greater number of rheumatic patients, the depressive influence is continued to the same degree during the continuance of the malady, rheumatism yielding much better to the sulphate of quinia. In the cases of typhoid fever, on the contrary, the pulse, at the end of some days, often reassumed by degrees its frequency, either when the disease became worse, or inflammation set in from the course of the affection or from local excitant action of the salt.

It frequently happened that the influence upon the circulation persisted many days after the suspension of the medicine, and in several cases patients

left the hospital with the pulse below the natural standard. As a general rule, however, the pulse was more rapid after convalescence than during the disease, and under the influence of the remedy.

M. Briquet argues that so constant an effect upon the circulation cannot be a fortuitous circumstance; it is absolutely necessary to admit that it is the result of medication; it is produced immediately by it; it ceases with it, and is found in its variations always in direct relation with the medicine. That the effect upon the circulation is owing to the influence over the disease M. Briquet is unwilling to admit, as the direct impression is too soon, and, moreover, the influence is perceived where it exercises little or no control over the disease, and this he shows by a *résumé* of his cases.

Modification of the force of the pulse.—The weakening of the pulse was noticed for the first time by Giacomini in a case where, by mistake, 12 grammes of the sulphate of quinia were taken at once. There were induced a dangerous state of syncope, and almost entire absence of pulse in the radial arteries, coldness of the skin, slowness of respiration, extreme feebleness of the voice, and imminent threatening of dissolution. Legroux also observed this extreme reduction. Briquet informs us that he has equally observed it, both in rheumatism and typhoid fever, and regards it as one of the effects the least doubtful of sulphate of quinia. The diminution of force, as that of frequency, is proportioned to the dose. This fact was further verified by experiment upon animals conducted with the *Hemodynamometer of Poisseuille.* The experiments are most interesting and ingenious. Our space forbids reporting them.

Action of the salts of quinia on the blood.—There is, at present, no doubt of the introduction of a quinia salt, or in fact of any of the salts of the cinchona alkaloids, into the circulation. It has been proved by the researches of Messieurs Henry, Lannaux, and Follin, as well as others. The question then arises, what effect is produced upon the blood itself? Friend, who first experimented upon this subject, upon the blood when drawn and subjected to the action of a decoction of bark, thought it became more fluid; a fact in opposition to experience with solutions containing tannic acid. Melier came to a like conclusion, as also Monneret and Legroux, with the sulphate of quinia.

M. Briquet, to determine the effect of the sulphate upon blood drawn from the body, performed similar experiments, and found that the effect was not absolute, but varied according to the quantity of the salt; thus, when 1 gramme of the bisulphate (neutral sulphate) was dissolved in 30 grammes of water and placed in contact with the same amount of recently drawn blood, it became at the end of 24 hours completely liquid. Examined by Mr. Donné under the microscope, the globules were found to be destroyed. With 25 milligrammes no effect was observable; 10 centigrammes rendered the clot soft. From the large quantity required to liquefy the blood out of the body, no inference can be drawn with respect to its effects in the system, and this point M. Briquet endeavours to elucidate. He experimented with six dogs, into whose jugular veins from 15 decigrammes to 2 grammes of the bisulphate of quinia were injected; the animals died soon after the injection. The blood *decidedly coagulated,* and the heart was filled with a *hard black clot* on the right side, and a *scarlet one* on the left. The same tendency to coagulation occurred in other experiments for different purposes, when the salt was taken by the stomach. But to determine the question by direct analysis he proceeded to determine the amount of the elements of the blood, before and after the administration of the medicine, and found, 1st, that always the amount of

fibrin increased after the introduction of the salt, and diminished when it was suspended; 2dly, that the globules diminished, a fact which he does not altogether attribute to the sulphate of quinia; 3dly, that always the quantity of water increased; and 4thly, that the amount of salts and fibrin was so little affected that the effect upon them may be said to be none.

The experiments upon the blood of dogs were conducted most carefully and upon a plan somewhat different from that of Andral and Gavarret. We present the results for the second experiment as an illustration of the results above stated:—

	Before the action of salt.	After the action.	Difference.
Dry fibrin . .	0 gr. 34	0 gr. 82	More than double.
Globules . . .	16 " 80	11 " 71	$\frac{1}{4}$ less.
Salts and albumen	8 " 42	7 " 27	$\frac{1}{6}$ less.
Water . . .	74 " 44	80 " 90	$\frac{1}{16}$ more.
	100.00	100.00	

But M. Briquet does not rest his views solely on his experiments upon animals, he appeals to his clinical observation. Thus in all cases he states, where he bled rheumatic patients treated by sulphate of quinia he found the blood well coagulated and covered by a thick buffy coat. With respect to the diminution of the red corpuscles he informs us that he has seen rheumatic patients treated by this remedy in doses of 3 to 4 grammes, in whom, besides titubation and collapse, there were evinced a waxy colour of the skin, paleness of the lips and gums, and coldness of the surface, which anæmic state was easily dissipated. In two cases treated with the quantity above mentioned he saw infiltration of the limbs and serous effusion into the thorax and abdomen, the serous diathesis, as he terms it, was, however, speedily removed; and finally in some cases treated in the same way a light hydræmic murmur presented itself. With reference to these experiments and observations he thus sums up:—

"Observation and experiment unite in demonstrating that sulphate of quinia does not liquefy directly the blood, but on the contrary the quantity of fibrin in it is notably augmented, and consequently all the inductions which have been drawn from a pretended liquefaction fall of themselves. As to the diminution of the number of globules and the augmentation of the proportion of serum, investigation does not afford anything sufficiently positive to establish between them and the sulphate of quinia a determinate relation."

Where a liquefaction of the blood is produced he attributes it to the poisonous action upon the organs, and the consequent organic and functional effects upon them affecting the fluids. We have given M. Briquet's results and statements as they are presented to us in his treatise. With respect to the pathological observations, how far they originated in the nature of the malady, rheumatism, with which they were connected, we leave to the experience of our readers.

Cinchonia.—It is not necessary to enter upon the proof of the effects of this alkaloid, as has been done with respect to quinia. It is sufficient to state that the results exhibited a like effect upon the action of the heart, but to a less degree. M. Briquet thinks that it is one-third less powerful.

Quinidia.—M. Briquet, from his experience, is of opinion that the impression of this base is nearly equal to that of quinia.

The *extracts* are only energetic in proportion to the amount of active principles that they contain.

Causes of the influence of the alkaloids of cinchona upon the circulation. —From experiments instituted to determine these, and which were conducted first by injecting the sulphate of quinia into the circulation of the brain from the carotid, and into that of the heart from the aorta and coronary vessels, M. Briquet came to the conclusion that the effect of the salt upon the circulation was not produced through the intervention of the brain, but that it had a direct action upon the heart itself. When injected into the general arterial circulation—the stomach, and the cellular tissue—these results were the same, only modified by the slowness of the impression upon the organ.

As a direct consequence of the depressing impression upon the heart is the production of a congested state of the blood in the venous system. In support of this M. Briquet states that he constantly found in animals killed by the sulphate of quinia considerable injection of the pia mater, distension of the large veins of the heart as well as of the lungs and mesentery, in which observations he is sustained by Giacomini and Melier. This distension was observed not only in those animals who survived the experiment several days, but in those who immediately succumbed to it. The buzzing in the ears, giddiness, and quinine intoxication, are attributed to the same condition. What occurs in the vessels of the brain occurs also in those of other organs, only that as distension of their vessels produces no appreciable disturbance, it is not perceived but upon autopsy. M. Briquet is led to suppose that the congestion is less in the capillaries than in the larger vessels, and that distension of the venous system of the brain may more easily occur than elsewhere.

From the power which bark or its alkaloids possess of depressing the circulation, its anti-inflammatory influence becomes conspicuous, and he attributes what is termed the tonic property to the other ingredients in bark, when this is used, or to the feeble doses of its alkaline salts.

To sum up the results of the observations which have been made by our author with reference to the depression of the circulation, the following propositions may be stated as we find them in his work, and it may be premised that they are derived from the study of three hundred cases.

1st. That the maximum of diminution in the frequency of the pulse rarely goes beyond 20 to 25 pulsations per minute in the 24 hours.

2dly. That the diminution of the frequency of the pulse is always in direct ratio to the previous acceleration.

3. That in no case is the pulse depressed below 40 pulsations per minute.

4. That the co-existence of a large proportion of fibrin in the blood, or of a sufficiently intense inflammation, exercises an influence upon the heart which the sedative influence of quinia exhibited in doses within the bounds of prudence cannot neutralize.

5. That the administration of the salts of quinia, in doses sufficient to produce a sedative impression upon the circulation, produces in the economy so serious a perturbation, that the risk ought not to be run, except when the disease is serious either from its duration, its gravity, or the accidents and danger to which it may expose the patient.

The idea of bark or its preparations producing an affection simulative of intermittent fever is discussed and denied in toto by our author. With respect to this point he authoritatively states—

"Although I have much employed the sulphate of quinia, and in large doses, I have never observed quinine-intermittent fever, nor anything which resem-

bles it. I have never recognized anything but the production of the phenomena of reaction developed under the influence of the excitant action."

Action upon the brain and its appendages.—After alluding to the notice which had been taken of the action of bark upon the brain, and especially of the impression of the sulphate of quinia after its discovery, M. Briquet proceeds to the exposition of his own experimental and observed results. The experiments were conducted by injecting the salt directly into the circulation of the brain through the carotid, by introducing it into the jugular vein, crural artery, pleura, and cellular tissue, or into the stomach. From which the following conclusions have been drawn by him:—

1. That the salts of cinchona have a direct and immediate action upon the encephalo-rachidian structure, the functions of which they pervert, weaken, or destroy.

2. That this action is divided into *two* periods, *one* during which there is *perversion* and *excitation*, the *other* during which *sedation* is manifested.

3. That the *first period* is as much more decided as these salts are introduced rapidly, directly, and in quantity into the brain, but its duration is proportionably short.

4. That the second period, which is sought for by medication in large doses, generally preponderates, but that it comes on much more quickly and lasts a much longer time when the salts are introduced indirectly and slowly, molecule by molecule, into the encephalon.

5. That this action is purely dynamical, and does not excite phlogosis but in rare cases, where the action has been too energetic or too direct.

Where death occurred in these experiments there was more or less deep injection of the pia mater, and inflammation of the membranes or substance of the brain. This latter was rare.

From the experiments upon animals let us now pass to the report of his therapeutical observations, from which it appears that patients who take from 25 to 30 centigrammes of sulphate of quinia at a time, or a gramme in divided doses in the twelve hours, usually suffer weight and derangement of the head, sometimes headache, often buzzing in the ears, vertigo, and light titubation. If the quantity of the salt is larger, or the doses nearer each other, these troubles are much more decided, are accompanied with a feeling of fulness, tension, and throbbing of the head, with redness and flushes of heat in the face, excitement of the eye, epistaxis, agitation, inquietude, and jerking of the extremities, phenomena indicating excitation of the brain. These derangements are often little marked, having a duration of some hours, after which moderate feebleness and somnolence, slight torpor and prostration are exhibited.

If the quantity of the sulphate of quinia is carried to two grammes and upwards, given continuously during several days, instead of light sedation, there are observed oppression and very decided sinking, stupor, much titubation, deafness, dimness of sight, dilatation of the pupils, obtuse sensibility, great weakness of muscular power, and trembling, phenomena which denote notable diminution in the general sensibility and contractility of the muscles.

And, finally, if the dose of the sulphate is too great, these accidents end in complete loss of consciousness, absolute loss of sight and hearing, insensibility and immobility. After the above general exposition of the effects produced by the salts of bark, M. Briquet proceeds to comment upon the most important of them, and, as his remarks are interesting, we shall follow him in presenting upon each effect such as are important.

Headache.—This symptom is not regarded of moment. In three hundred

subjects treated by sulphate of quinia it did not acquire the least gravity. In typhoid fever the headache was rather allayed by the medicine.

Trouble of audition.—The buzzing, when intense, is accompanied with difficulty of hearing. Deafness, however, is infrequent, and he has seen it only twice. The buzzing appears to come on soon, and to last in proportion to the quantity taken. Deafness, from his own observation and that of others, passes off with the other symptoms, but still it has been lasting for a length of time in certain cases, and has even been permanent. He attributes this latter symptom to paralysis of the auditory nerve.

Trouble of vision.—This is less common than the preceding. It is accompanied with dilatation of the pupil, and difficulty of seeing objects, often double. He has seen four cases of incomplete amaurosis following very large doses continued, in one case lasting a month. This symptom may be accompanied by all the worst effects upon the brain, or only by deafness coming on rapidly or slowly. In no case has amaurosis been complete or incurable. It is attributable to a paralysis of the optic nerve.

Vertigo and titubation.—These are among the most common effects of sulphate of quinia. They are for the most part incident to the effort to rise, which causes a kind of syncope, with its concomitants. They are remedied by the horizontal position, but may last several days after the withdrawal of the medicine. Titubation is less frequent than vertigo, and is caused by large doses, usually 2 grammes per diem. It accompanies the very decided effects upon the brain. It is dissipated with ease, and lasts but a day or two after the remedy is suspended. He considers it owing to nervous prostration, and resembling a similar condition in typhoid fever. M. Monneret has given it the name of *typhic state.* It may be accompanied by epistaxis. In the presence of titubation, M. Briquet counsels the suspension of the medicine.

Delirium.—This is rarely observed, and only when the subjects are endowed with excessive nervous susceptibility in feverish conditions or plethora, and when the medicine is given too rapidly. In two hundred cases treated for rheumatism he has seen it six times. Trousseau and Husson each report a case where it occurred. Monneret, Legroux, and Vigla have also seen it. The name *quinine intoxication* has been given to this condition, which assumes different forms, following the course of that from alcohol. M. Briquet is of opinion that this delirium no more depends upon meningitis than ordinary intoxication. It comes on slowly and lasts usually but a few hours. It is dependent on congestion. The treatment of it is suspension of the medicine and the usual course.

Meningitis.—This inflammation is one of the gravest accidents that can be attributed to the sulphate of quinia, if the facts reported were as conclusive as has been supposed. M. Briquet, however, assures us that in his whole experience he has not met with a case that could be attributed to the remedy, and by an analysis of the cases, few in number, which have been reported, as well as by exhibiting that meningitis is an attendant upon rheumatic attacks, the disease in connection with which that complication presented itself after large doses of sulphate of quinia, has brought a strong argument to bear against the supposition that it was the result of treatment. Yet he does not deny the possibility of meningitis being produced by the salt. In this respect it resembles alcohol, which, with a tendency to disturb in a similar way the actions of the brain, rarely induces the affection alluded to.

Convulsions.—The occurrence of these, one of the gravest results of derangement of the brain, is rare. They may result in experiments upon animals when the sulphate of quinia is introduced too suddenly, or in too

great quantity. Although cases of the production of convulsions are on record, M. Briquet informs us that neither he nor his colleague, M. Blache, has ever seen the least approach to them in the patients treated for typhoid fever or rheumatism, and yet the sulphate of quinia has been carried to from 3 to 6 grammes in the 24 hours in the former disease. He thinks that when occurring it is from the mal-administration of the medicine, giving too much at a time and not dividing the doses.

General collapse.—When experimenting upon animals, collapse was frequently brought on, and the phenomena pertaining to it have presented themselves in man, the result of the depressing power, already dilated upon, carried to an extreme extent. Such results have been reported by Giacomini and Guersant, but excessive doses were taken, in one case 12 grammes and in others over 16 grammes. The symptoms were extreme weakness and prostration, immobility, coma and loss of consciousness, insensibility of the skin, of sight, hearing, dilatation and immobility of the pupils, livid appearance of the face, laboured respiration, sinking of the pulse and coldness of surface. The effects, in fact, of narcotics. One of the cases proved fatal, but the author has not met with such cases, although with the 2 and 3 grammes daily, the sedative effects were fully developed.

Paralysis.—This he has never seen, either in his experiments, or in the treatment of his patients.

The action of sulphate of quinia upon the spinal marrow is, in his view, the same as upon the brain. With respect to cinchonia and its salts the mode of operation is similar to that of the more potent principle and its salts, varying only in degree, and the same may be said of quinidia and quinoidine.

Effects upon the lungs.—The respiratory apparatus is one of those upon which cinchona in large doses exercises the least influence; the symptoms may be taken separately.

Præcordial uneasiness.—This sometimes is marked and agonizing, with alteration of the features and colour. It is usual in the weak or nervous. M. Briquet regards the symptom as an indication to stop the medicine or diminish the dose.

Dyspnœa.—This he has seen twice, the paroxysms resembled the effect of cutting the pneumogastric nerve, and appeared to be an effect of sedative action on these nerves.

Engorgement of the lungs.—With respect to this the author asserts that "the greater number of experiments and all observations in disease agree in establishing the fact that the sulphate of quinine does not produce directly either active or passive congestion of the lungs."

Action on the alimentary canal.—The *mouth* is usually little affected by the use of sulphate of quinia, and he has rarely seen the mucous membrane inflamed, yet the continued exhibition in large doses may lead to diphtheritis. The *tongue* presents habitually at the end of a few days, from the use of 2 or 3 grammes daily, a whitish, tenacious coating, which slowly passes off; rarely does the surface become red and dry. When 1 or 2 grammes are given daily, it undergoes usually no modification. Even in typhoid fever the dryness of the tongue and fuliginosities are not augmented. The reverse may even take place, and the tongue improve. The *pharynx* is rarely irritated; this occurred but twice under his observation.

The *stomach* is affected by the salt differently, according to the state of the system, whether presenting no fever or feverish, according to the condition of the organ whether healthy or irritated. In the non-feverish condition it acts as a stimulant and tonic. When the stomach is irritable, nausea and

vomiting may occur. In the ordinary doses the sulphate of quinia is tolerated by the stomach, but if incautiously given it may provoke inflammation, or if inflammation exist it may be increased.

Upon the intestines very much the same effects may be induced, and the same circumstance may be regarded as modifying the action. Purgation may be induced from the irritant impression. In their impression upon both the last mentioned organs the sulphate of cinchonia and the salts of this base are less active. Quinoidine and quinidia resemble quinia. The preparations of bark are likely to be astringent.

Action upon the spleen and liver.—With respect to the first mentioned organ, contrary to the assertion of Piorry that a direct and immediate contractile influence is exerted upon it, M. Briquet informs us "that he has treated a certain number of fever patients labouring under enlargement of the spleen, with a solution of 1 gramme of sulphate of quinia in alcohol, and in none of the cases has he seen in eight or ten minutes (as claimed for the remedy) the slightest change of volume;" yet these tumefactions were resolved subsequently by the prolonged use of it.

With respect to the liver, although from the routes of absorption this organ is necessarily reached by the salt, and it has been detected there superabundantly by Lannaux and Follin, yet we know nothing of any peculiar effect it is capable of producing.

Action upon the urinary and genital organs.—As the kidneys constitute an emunctory for its elimination, and the sulphate of quinia is a local stimulant, it may be anticipated that a diuretic effect can be produced. Inordinately it may produce the effect of stimulating diuretics, cases of which are on record, in the form of inflammation of the bladder or hæmaturia, or strangury. The idea that it has an effect upon the uterus has attracted attention to it as an emmenagogue. M. Briquet states that upon the latter organ he has observed no marked influence.

The local action of the sulphate of quinia upon the skin is irritant, and hence the suffering which sometimes attends its application endermically. Upon the sound skin some irritation may be produced. Connected with the internal exhibition, where there is a lowering of the circulation there is reduction of the temperature of the skin.

With this exposition of the action of the sulphate of quinia and the salts of bark upon the several organs of the body terminates the first part of the treatise. Our limits do not permit us to present the admirable "showing up" of Homœopathy with which the author treats us in the conclusion of this part, but if ever the absurdity and folly of Hahnemann were exhibited to the world, they have been to their full extent by M. Briquet.

Part second *is devoted to the mode of absorption and elimination of the salts of cinchona.*

M. Briquet infers that there is no change or decomposition of the alkaloids in the stomach, but that they are immediately absorbed and taken into the circulation without the action of the stomach upon them, or in other words undergoing changes from digestion. The salts of the alkaloids, however, may be subject to the same reactions as exterior to the body, but the alkaloids are left for easy or impeded absorption according to circumstances. As in the uncombined state the solution of them is limited, when combined with acids the salts formed are introduced in proportion to their solubility. The rapidity is marked by the impression on the sensorium. The presence of quinia in the blood has been determined by Lannaux and Follin as well as by M. O. Henry and Fordos.

In opposition to the opinion of M. Mialhe, that the salts of the alkaloids are decomposed in the blood and the bases uniting with the albumen thicken that fluid, our author presents the following experiments which were made by himself and M. Quevenne.

1. A filtered saturation of sulphate of quinia was mixed with serum, just in equal amount, and then with a third part of that liquid at the temperature of 20 C. In neither of the mixtures was there any deposit in 24 hours.

2. 5 centigrammes of neutral sulphate of quinia were placed in contact with 20 grammes of pure water, and with a like quantity of serum. The solution in the serum was complete in 24 hours, while in the water there were turbidity and deposit.

3. 10 centigrammes of the same salt were treated in the same way as in the 2d case. In both cases the solution was not complete, but in the water the deposit was double that in the serum.

These experiments were repeated at the temperature of the body with the same results, with only the difference of a little greater solubility in the water from greater elevation of temperature.

If the acid be a vegetable acid forming a salt of the alkaloids, this acid obeys the usual law of decomposition, with a transformation into carbonic acid, and its combination with the base, but the undecomposable acids retain their identity in the circulation in combination with the alkaloids.

As the salts of the alkaloids enter the circulation it would be reasonable to anticipate that they can be detected in the organs. This is the case, as the sulphate of quinia has been detected in the liver, and there is no doubt that the other organs under favourable circumstances may evince its presence. The secretions, however, present an open field for this investigation. By Landerer it has been detected in the tears and in the milk, by the same experimenter and M. Quevenne, in the effused fluid of dropsies. It has not been detected in the sweat or the bile.

The most important secretion in which we may look for the sulphate of quinia or its analogues is the urine. From the observations of M. Briquet it appears that one-half if not more finds an exit by this route. This fact, first stated by M. Piorry, was fully demonstrated by the experiments of Mess, Levolley, and Fermond, under his auspices. Whether the portion of the salts of cinchona not to be accounted for by elimination with the urine goes off entirely by the other secretions, or is decomposed and worked up in the economy like many other substances, is a point still remaining unsettled.

The mode of detecting sulphate of quinia in the urine recommended by M. Briquet, is by the use of the iodo-iodide of potassium, which produces an orange-brown precipitation. The formula which he gives for this test is ʒj of iodine, ʒij of iodide of potassium to fʒviij of water. In his hands this solution will detect $\frac{1}{5000}$ of the alkaloid in the solution, or a half centigramme to the litre. This certainly is delicate manipulation.

For therapeutic purposes there are three points to be determined; *first*, the time required for absorption; *secondly*, the sojourn of the salt in the organs; and *thirdly*, the relation between the quantity administered, the quantity absorbed, and the effects produced; each are considered.

Rapidity of absorption.—The time required for cinchona to affect the system has been variously estimated. Torti, Bretonneau, and others, have regarded it as twelve or more hours. Piorry regards the effect as immediate. Two modes of determining this present themselves; one, the search for the existence of the substance in the economy; the other, the observation of its physiological effects: with respect to the first, all means of detection are diffi-

cult except in the urine, and to this secretion, then, have we to resort. M. Briquet has found sulphate of quinia in this secretion in half an hour from its ingestion, and at the end of two hours a most abundant precipitate was produced by the test above stated. The observation of the physiological effects leads to the conclusion that the time varies from a few minutes to a quarter of an hour, with elevated doses (a gramme for instance), and that the time required is longer with smaller quantities—in fact proportionable is the time to the dose and its repetition. The limits which he places upon the action of salts of the alkaloids of cinchona are from half an hour to two hours. This consideration is important in connection with the treatment of cases according to their urgency.

Quantity of the substances absorbed.—Experiment and observation show that the quantity of the salts of cinchona taken up by absorption is always in proportion to the quantity taken into the stomach—thus the abundance of the precipitate in the urine is as the amount of substance administered: 8 grains of sulphate of quinia in twelve hours will give a yellow tint or light cloudiness, while 30 will produce a deep precipitate. The constancy of the precipitate is equally in direct relation to the quantity of the sulphate taken.

Mode of elimination.—As the alkaloids of cinchona and their salts belong to inassimilable bodies it is necessary that they should be eliminated from the economy as substances of like nature. According to the researches of Woehler, Kramer, Orfila, Chatin and Bernard there are two modes for the expulsion of matters from the economy: these are general and particular. In the case of the articles under consideration, although the general emunctory secretions, as the tears, mucus, saliva, &c. may discharge them in small amount, yet the notable determination to the kidneys preponderating so greatly as has been shown, almost determines this way to be the special one, constituting in the sense just stated, the particular mode of elimination.

March of elimination.—With respect to this head the experiments and observations of M. Briquet have given the following results:—

1st. The salts of cinchona are not as rapidly eliminated as certain other substances, as the iodide of potassium, cyanuret of iron, of mercury, &c. The rapidity of elimination has been previously given. The lingering in the economy a greater time than the articles alluded to, has been supposed to depend upon the organic nature of these substances.

2. When the elimination has once commenced, it continues with certain regularity, and during the day of exhibition the urine maintains a current of depuration. This is exhibited by the following experiment: Between 5 and 6 o'clock A. M., a patient took 20 centigrammes of the sulphate of quinia, and at 8 o'clock was detected in the proportion of *one* centigramme to the litre; at 12 M. of 5 centigrammes; at 4 P. M. of 10, and at 8 P. M. of 10, were detected.

If, however, instead of divided doses, a single dose of 20 centigrammes is given, the order is somewhat changed. In one hour in the proportion of 2 to 3 centigrammes are discharged; in 4 hours of 8; in 7 hours the same; in 11 hours of 5 to 6 centigrammes, and in 15, of 3 to 4 centigrammes. From these experiments we may suppose that when the alkaloid is gradually introduced into the economy, it penetrates the tissues in like manner, and not exerting much reaction, is slowly expelled; while on the contrary, introduced suddenly it excites a reaction which causes it to be eliminated from the commencement in considerable quantity. From this is deduced that when it is desirable the medicine should not be expelled too rapidly, it should be administered slowly and, gradually, and, in the language of M. Briquet, this is the

reason why, when very large doses of sulphate of quinia have been taken at once, no mortal effects have occurred, while such accident has nearly happened when these quantities have been taken gradually.

3. The quantity of alkaloid eliminated is always in proportion to the quantity taken: thus when 20 centigrammes were taken in 5 doses at intervals of an hour, 4 centigrammes were eliminated in 24 hours; when 30 c., 9 c; 40 c. gave 12 c.; 50 c. gave 14 c.; 60 c. gave 20, &c. In the case of the dose being administered at one time the same rule holds, only less of the article is eliminated in the 24 hours, except where a high dose is given. There is reason to think that the proportion is not maintained where either very small or very large doses are given.

The rule which M. Briquet has observed to exist from sufficiently numerous experiments, with respect to the entire amount eliminated, is as follows: that when the salts of the alkaloids are given in moderate doses, and continued at intervals during three or four days, *one-third* is expelled, and when taken in one dose, daily, one-half is eliminated. He inclines to the view that what is not expelled is used upon the economy, or burnt as the phrase now is.

Period of elimination.—This question is an interesting one. From an analysis of the facts presented, M. Briquet comes to the following conclusion: that the elimination is feeble on the first day of administration, gradually increases during the following days, arrives on the fourth or fifth at a sort of maximum, and goes on decreasing gradually, although the medicine continues to be administered. The elimination continues after the medicine has been suspended during a period varying from three to six days, whatever the time during which the administration has been conducted. As the quantity which should be eliminated is fixed, as has been before stated, if the elimination is not abundant at first, it must continue a longer period. The reverse of which occurs if the elimination is at first abundant. The mode of administration necessarily influences the period of elimination; when the salts of cinchona are given in large quantity at once they are rapidly eliminated, when in fractional doses the elimination is slower.

There are a number of circumstances which influence the action of the salts of cinchona upon the economy. Age is one. From the experiments of M. Briquet, supported by observation, it appears that young animals and children are less affected by proportional doses than older animals and adults—old people are easily affected: with respect to sex it appears that absorption and impression are greater in females than in males, and with respect to condition, the most robust are less easily affected by these preparations.

M. Briquet concludes this part of his essay with observations upon the influence of other modes of treatment or medication in several ways, upon the system. These are extremely interesting, but we have no space for their summary, or an extension of our essay by an analysis of the remaining chapters, devoted to the therapeutic application and modes of administration. We have already extended our paper beyond the limits intended at its commencement, and must here close, presenting our apology for length in the full exposition of the physiological portion of the subject—a portion of our information upon cinchona of the highest consequence, and which heretofore has never been so fully or satisfactorily elucidated. J. C.

ART. XII.—*Traité de Chimie Anatomique et Physiologique, Normale et Pathologique, ou des Principes Immediats Normaux et Morbides qui constituent le Corps de l'Homme et des Mammifères.* Par CHARLES ROBIN et F. VERDEIL. 3 volumes, et Atlas de 45 Planches. Paris, 1853.

Treatise on Anatomical and Physiological Chemistry, Normal and Pathological; or of the Immediate Principles, Normal and Morbid, which constitute the Body of Man and of the Mammiferæ. By CHARLES ROBIN and F. VERDEIL. 3 vols., and an Atlas of 45 Plates. Paris, 1853.

THIS work is so important, and contains so many new views and new facts which are very little known, particularly in this country, that although three years have elapsed since its publication, it cannot be considered too late now to review it.

One of the authors of this treatise, M. Charles Robin, whose name already ranks among those of the most distinguished anatomists of the age, is as well known in America as in Europe. His collaborator, M. Verdeil, though much less known here, has made some very interesting discoveries in chemistry and physiology. His researches into the composition of urine and of the blood, and especially on the existence of hippuric acid in this latter fluid, his discovery of a new acid in the lungs, and his fruitful investigations on the vegetable and animal colouring matters, have already placed him high among the young European chemists.

The idea of writing this very original treatise of Physiological Chemistry, belongs to M. Ch. Robin. While engaged in the composition of his great work on General Anatomy, he found it necessary to describe first the chemical elements of the animal economy, and not being contented with the description of their physical characters, he was led to examine their chemical history, and had, therefore, to ascertain where they are found, how and where they are produced, how they may be extracted, what becomes of them, &c. He soon felt the need of the aid of a chemist, and for this he could hardly have had a more valuable assistant than M. Verdeil.

This statement partly explains the apparently strange title of the work of Messrs. Robin and Verdeil. They call it Anatomical Chemistry, although they do not mean by this title a chemical history of the elements of the body. They wished to call their publication a treatise on the anatomy of the immediate principles of the animal economy, as, for their purpose, they considered chemistry not as a science, but as an instrument, or rather as a means of *dissection*. But the publisher of their work, being afraid that it would not sell so well with such a title, compelled them to give to it a more orthodox appellation. They protest, however, against this compulsion, and declare, in their preface, that they have not written a treatise on chemistry, but that their work is a treatise on the anatomy and physiology of the immediate principles, studied with the help of chemistry, natural philosophy, and microscopy. Their work is the first of the kind which has ever been published; it gives a complete chemical, physical, anatomical, and physiological history of the immediate principles, neglecting entirely the theoretical speculations which fill the books of chemists.

The immediate principles which are the sole objects of this original work are defined as follows by our authors, after M. Chevreul: *the final products, solid, fluid, or gaseous, resulting from a well conducted anatomical analysis of the various humours and anatomical elements susceptible of no further division without an alteration of their chemical nature.*

The first of the three volumes of which this work consists, is devoted to the general history of the immediate principles. After a long introduction, in which the authors try to show that the science of the immediate principles belongs to anatomy and not to chemistry, their first volume contains an exposition of the characters of the immediate principles, their classification and nomenclature, the means of analysis, and historical notions. The second and third volumes contain a very complete exposition of all that was known at the time the book was written, of each of the immediate principles and of substances which have been erroneously considered as such.

In the first volume the authors insist upon their view that the study of the immediate principles belongs to anatomy and not to chemistry; they show that no matter by what means we separate a principle from humours or from solids, in the state in which it exists in them, and without producing in it any chemical alteration, we make a dissection, as well as when, with a knife, we separate a nerve from a muscle or from an artery. They show that the animal body is constituted of two sorts of elementary parts, the study of which is the object of general anatomy—the immediate principles and the anatomical elements.

They successively examine—1. The *mathematical* characters of the immediate principles (number, situation, volume, form, duration). 2. Their *physical* characters. 3. Their *chemical* characters. 4. Their *organoleptical* characters (their impressions on our senses and on our various organs). 5. Their *organic* characters. 6. Their variations according to sexes, ages, races, species, and anormal or pathological states. 7. Their formation. 8. Their influence and their share in the organic or vital actions. 9. Their chemical composition. 10. Their extraction and their chemical reactions. 11. Their crystalline forms. 12. Their influence on light (polarization, double and simple refraction, &c.). 13. The influence of light upon them. 14. Their solution in the liquids of the body. 15. Their influence as ferments or in contact with ferment (catalysis, &c.). 16. Their putrefaction. 17. Their microscopical examination. 18. Their chemical reactions on the field of the microscope. The most remarkable and original parts of this first volume are those concerning the crystallography and the catalytic phenomena. There is a complete treatise of the crystallography of the immediate principles, extending over a hundred pages.

Many views and facts, interesting to physiologists and physicians, are exposed in the chapter concerning the catalytic phenomena. We will point out some of them. It is known that in a catalysis a chemical change (a combination or a decomposition) takes place in many substances when they are in contact with certain bodies. For instance, when an alkali, or a small particle of fibrin, of silk, of cotton, or of humus, are placed in contact with the bioxide of hydrogen, they decompose it; and, on the other hand, if platina, gold, charcoal, and other porous bodies are placed in contact with hydrogen and oxygen in the proportion required for the formation of water, this liquid is formed. In these two cases the substances which produce a chemical decomposition, or a chemical combination, do not participate chemically in what takes place; they remain as they were without the slightest alteration. Messrs. Robin and Verdeil try to prove that many of the phenomena of digestion, nutrition, secretion, &c., are mere catalytic phenomena. Nobody considers the transformation of starch into dextrine, and of dextrine into glucose under the influence of sulphuric acid a vital action; yet many persons are inclined to consider as vital the same transformations when produced by salivary diastase. The two phenomena are completely similar, and must have the same name; if one is a catalysis, the other also is a catalysis.

The various organic catalytic bodies, such as the vegetable diastase, the pectase, the synaptase, the myrosine, the animal diastase, the pepsin, all act in the same way—that is, in producing chemical changes without being themselves submitted to any change. All these substances are products of alterations of albuminous substances in animals and plants, and they have the same elementary composition as the substances from which they have been drawn. They do not exist as immediate principles either in plants or animals.

All the humours or tissues from which catalytic bodies are extracted, are able to produce the same phenomena as these bodies separated from them. So it is that saliva acts like diastase to produce the dextrinic, glucosic, and alcoholic catalyses; so it is that the muscular, the serous, and the mucous membranes of the stomach and of the bladder act like pepsin, &c. But this depends, certainly, on alterations in these tissues or in the saliva, producing there the catalytic substances (diastase, pepsin, &c.).

When a catalytic body becomes altered, its influence changes; for instance, when diastase has been exposed to damp air for two days, instead of changing starch into glucose, it transforms this substance into lactic acid. It might prove useful in certain cases of gastralgia, depending upon an excessive acidity of the contents of the stomach, to examine if the primitive cause of the affection is not an alteration of saliva, having changed its properties so that it transforms starch into lactic acid, and not into glucose.

Messrs. Boutron and Fremy have shown that various degrees of alteration of a membrane enable it to produce different catalytic phenomena. So it is that when fresh membranes are placed in contact with sugar, they successively form, according to their degree of modification, lactic acid, mannite, a viscous matter, and at last carbonic acid and alcohol. If the mucous membrane of the stomach has been washed with a great deal of water, it seems to have no catalytic influence; but if left some time in water, it becomes altered and then transforms glucose into lactic acid. A dried bladder, exposed to damp air, soon acquires the power of producing this same catalysis.

It has been imagined that the catalytic phenomena due to altered or putrefied animal matters result from some action of vegetable or animal organisms. Messrs. Robin and Verdeil affirm that this view is erroneous. In the first place, as it is known that vegetable organisms do not develop themselves in alkaline liquids, and as putrefied animal matters are alkaline, these organisms cannot originate there. Moreover the microscope shows that there are none in or upon the putrefied matters. As regards the existence of animal organisms, our authors have seen that putrefied meat without any trace of infusoria put with glucose under mercury determined fermentation in two or three hours. Analogous experiments with other catalytic substances, such as diastase, pepsin, acids, alkalies, etc., prove that their influence is entirely independent of the formation of vegetable or animal organisms.

Messrs. Robin and Verdeil show that it is not the yeast plants (*cryptococcus* and *torula*) which are active in certain fermentations; but that it is the altered gluten on which these vegetable organisms are developed.

It has been said that when infusoria were injected into the bloodvessels of an animal, it died because those animalculæ produce fermentation. It is true that a fermentation then occurs and causes death, but it is only after the infusoria have died—and after their organic matter has become altered and even dissolved that they cause fermentations.

From the facts above mentioned, and from many others, Messrs. R. and V. conclude that the belief that fermentations and catalyses in and out of the animal body are vital actions, is entirely erroneous.

In another part of their history of catalytic phenomena, our authors show the distinction existing between fermentation, putrefaction, and the other catalyses. The simplest catalyses are those in which mere transformations or combinations take place. In fermentations there is a decomposition of one substance into two or three, with production of heat and generally of carbonic acid. In putrefactions there are phenomena like those of the simple catalyses and those of fermentation, with phenomena of combustion. We owe to Berzelius the idea of the similarity of these three kinds of physico-chemical phenomena (catalysis, fermentation, and putrefaction).

Messrs. R. and V. show that the attempts at an explanation of the catalytic phenomena by imagining a *catalytic force*, or by supposing that electricity is their cause, do not explain anything. Disciples of Auguste Comte, like him, they do not admit the existence of *forces;* they only admit that matter is endowed with properties, which manifest themselves when the conditions necessary to their manifestations exist.

We must refer the reader to the work of our authors for what relates to the following catalyses: 1st, the hydric; 2d, the nitrous; 3d, the acetic; 4th, the pectic; 5th, the dextrinic or glucosic. But we will say a few words on some other kinds of catalyses. Prof. Bernard and M. Verdeil have found that blood has the property of transforming glucose into lactic acid. This explains why glucose injected into the bloodvessels quickly disappears; and also why the sugar produced in the liver disappears in the blood in the short time of the passage between the liver and the lungs through the heart. If too much sugar is mixed with blood this liquid becomes altered before the lactic transformation is complete, and then the blood losing its ordinary catalytic property and becoming a ferment, the remainder of the sugar is transformed into alcohol and carbonic acid.

Another species of catalysis deserves a few remarks. Our authors admit that pepsin is not a special product of secretion of the stomach, but simply the gastric mucus altered by the air introduced with the aliments. They partly base this view on the fact that animal matter from many organs may give origin to pepsin when it is altered by air. The action of pepsin in digestion they consider, with many physiologists, as merely catalytic.

Messrs. R. and V. describe many other kinds of catalysis and all the fermentations and putrefactions. We have no room to analyze their interesting exposition of facts on these subjects. We will merely say that they consider the formation of most of the immediate principles, which take their origin in the animal economy, as due to a catalysis. The catalytic body, that is, the substance which without furnishing any element produces a chemical change in other substances, is, in this case, the tissues or the blood. Albumen, fibrin, casein, uric acid, etc., are formed in this way. The phenomena of nutrition and secretion result from catalytic changes. We think that these views, which previously had been proposed by other physiologists, are very probable, but that they still require demonstration.

Messrs. R. and V. admit as immediate principles some which had not been considered as such before them, and they expel from the list of these principles many substances which they think have not been proved to be real immediate principles, or which positively are not such. They divide their second and third volumes, which are devoted to the special study of the immediate principles and of other substances found in the animal body, into several parts, as 1st, the real immediate principles; 2d, the accidental immediate principles; 3d, the badly determined principles, the doubtful principles, and the bodies erroneously considered as immediate principles.

We have arranged a few tables, which will give at a glance the list of all the real and the probable immediate principles (or considered so by Messrs. Robin and Verdeil) existing in man, and we indicate where these substances are found in the normal anatomical elements and humours, and also in some morbid, solid, or liquid substances.

CLASS I.

Mineral or Inorganic Immediate Principles.

		Where found.
1st Division.	1. Oxygen	Everywhere.
	2. Hydrogen	Everywhere.
	3. Nitrogen	Everywhere.
	4. Carbonic acid	Intestinal canal, blood, urine, expired air.
	5. Carburetted hydrogen	Large intestine, expired air.
	6. Sulphuretted hydrogen	Large intestine, expired air.
	7. Water	Everywhere.
2d Division. Saline principles.	1. Chloride of sodium	Everywhere, except in enamel of teeth.
	2. Chloride of potassium	Milk, muscles, liver, blood, urine, bile, gastric juice.
	3. Fluoride of calcium	Bones and teeth.
	4. Chlorhydrate of ammonia	Saliva, tears, urine.
	5. Carbonate of ammonia	Expired air.
	6. Carbonate of lime	Bones, lungs, concretions, brain-sand, tubercles, etc.
	7. Carbonate of magnesia	Blood, urine of some animals.
	8. Carbonate of soda	Blood, lymph, urine.
	9. Bicarbonate of soda	Blood
	10. Carbonate of potash	Blood, saliva, brain-sand.
	11. Sulphate of soda	Everywhere, except milk, bile, and gastric juice.
	12. Sulphate of potash	Everywhere, except milk, bile, and gastric juice.
	13. Sulphate of lime	Blood, fecal matters, biliary calculi, pancreatic juice.
	14. Basic or neutral phosphate of lime	Everywhere, but particularly bones.
	15. Acid phosphate of lime	Urine.
	16. Phosphate of magnesia	Everywhere.
	17. Ammoniaco-magnesian phosphate	Sometimes in urine, calculi, fecal matters in disease.
	18. Neutral phosphate of soda	Everywhere.
	19. Acid phosphate of soda	Urine.
	20. Phosphate of potash	Almost everywhere.

CLASS II.

Crystallizable Organic Immediate Principles.

1st Division. Acid and saline principles.	1. Lactic acid	Gastric juice, muscles, sweat.
	2. Lactate of soda	Blood tubercles.
	3. Lactate of potash	Muscles and gastric juice?
	4. Oxalate of lime	Urine.
	5. Uric acid	Urine, urinary and biliary calculi.
	6. Neutral urate of soda	Urine, gouty concretions, blood, urinary calculi.
	7. Acid urate of soda	Urine, gouty concretions.
	8. Urate of potash	Urine, urinary calculi.
	9. Urate of ammonia	Urine, urinary calculi.
	10. Urate of lime	Gravel, urinary calculi.
	11. Urate of magnesia	Urinary calculi.
	12. Hippuric acid	Urine.
	13. Inosate of potash	Muscles.
	14. Pneumic acid	Lungs.
	15. Pneumate of soda	Lungs, blood.
	16. Taurocholate of soda	Bile.

		Where found.
2d Division. Neutral or alkaloid animal principles.	1. Creatine	Muscles, blood, urine, amniotic liquid.
	2. Creatinine	Muscles, blood, amniotic liquid, urine of some animals.
	3. Urea	Blood, urine, vitreous and aqueous humours, amniotic liquid, saliva.
	4. Chlorosodate of urea	Urine, amniotic liquid?
	5. Cystine	Gravel and urinary calculi.
3d Division. Sugars.	1. Liver-sugar	Liver, blood, urine, lymph, chyle, cerebro-spinal fluid.
	2. Milk-sugar	Milk.
4th Division. Fatty substances and soaps.	1. Cholesterin	Blood, bile, liver, brain, nerves, crystalline lens.
	2. Serolin	Blood.
	3. Oleic acid	Blood, bile.
	4. Margaric acid	Blood, bile.
	5. Oleate of soda	Blood, bile, lymph.
	6. Margarate of soda	Blood, bile, lymph.
	7. Olein	Fats, blood, chyle, urine, eggs, milk.
	8. Margarin	Fats, blood, chyle, urine, eggs, milk.
	9. Stearin	Fats, blood, chyle, urine, eggs.

CLASS III.

Coagulable and not Crystallizable Organic Substances.

1st Division. Liquid organic substances.	1. Fibrin	Blood, chyle, lymph, liquid of ascites, and of blisters, etc.
	2. Albumen	Muscles, blood, lymph, chyle, amniotic liquid, etc.
	3. Albuminose	Blood, chyle.
	4. Casein	Milk, blood? arteries?
	5. Pancreatine	Pancreatic juice.
	6. The mucosines	Mucus, urine, saliva.
2d Division. Solid or half solid organic substances.	1. Globulin	Blood-corpuscles.
	2. Crystalline	Crystalline lens.
	3. Musculin	Muscles.
	4. Elasticin	Yellow ligament, arteries.
	5. Cartilagein	Cartilage, cornea.
	6. Ostein	Bone.
	7. Keratin	Hair, nails, horn.
3d Division. Colouring or coloured organic substances.	1. Hematosin	Blood-globules.
	2. Biliverdin	Bile, biliary calculi, placenta, blood.
	3. Melanin	Pigment of the skin, the brain, and the eye.
	4. Urrosacine	Urine.

Probable or Badly Determined Immediate Principles.

1. Silica	Blood, muscles, hair, wool, saliva, bile, urine.
2. Leucine	Blood, lungs, liver.
3. Xanthine	Urinary calculi.
4. Hypoxanthine	Spleen.
5. Lienine	Spleen.
6. Two special acids	Urine of man.
7. Hematoïdin	Blood crystallized.
8. Butyrine	Milk.
9. Caprine, caproïne, and capryline?	Milk.
10. Butyroleine	Milk.
11. Phosphuretted fats	Nervous centres, blood, yolk of the egg.
12. Cerebral acid	Brain.
13. Cerebrate of soda	Brain.
14. Neurine	Nervous centres and nerves.
15. Synovine	Synovia.
16. Lacrymine	Tears.
17. Spermatine	Sperma.
18. Special albumen of dropsical liquid	Liquid of ascites.
19. Paralbumine	Liquid of ovarian dropsy.
20. Pyine	Pus.

One of the most interesting articles of the special parts of the treatise of Messrs. R. and V. is that relative to fibrin. Of the various points concerning the history of the coagulation of this principle, we will merely relate here those which are not generally known, or which have been discovered or ascertained by our authors.

1. Coagulation of fibrin begins soonest in the blood of weak individuals, of those who have been exhausted by many bleedings, of patients who have long been suffering from chronic diseases, and of those labouring under typhoid fever. A cachectic state in animals seems to have the same influence as in man on the rapidity of coagulation. One of the authors has seen the blood of sheep affected with a chronic disease coagulating quicker than usual.

2. Fibrin coagulates in from 10 to 20 seconds; *i. e.* with extreme quickness, when blood comes in contact with threads and thin rods, or with a sponge or dust, which can absorb water.

3. In the liquid of ascites, M. Delaharpe has seen fibrin to coagulate a few instants after tapping. This takes place when the liquid is left without agitation; but one of our authors has noticed that coagulation is delayed as long as the liquid continues to flow into the vessel. The liquid of ascites often contains fibrin enough to take the appearance of a trembling, opaline jelly, which, by degrees, becomes more solid. In cases where there is not fibrin enough for the formation of a jelly, filamentous fibrin may be obtained by the aid of a feather, to which that substance will attach itself. One of the authors has ascertained the exactitude of these facts advanced by M. Delaharpe.

4. According to M. Delaharpe a temperature a little inferior to that at which albumen coagulates, prevents coagulation of fibrin in the liquid of ascites. It would be very interesting to ascertain the truth of this statement, as, if it were proved to be correct, it would be a very strong argument against the recent theory proposed by Dr. Richardson, of London, in his prize essay.

5. Our authors admit the correctness of the view of M. Bouchut concerning the cause of *phlegmasia alba dolens*, which view consists in the supposition that fibrin coagulates in the veins, in this affection, not because they are inflamed, but because there is an excess of fibrin and a notable slowness of circulation in the dilated veins of the inferior limbs. This last reason, *i. e.* the stasis of the blood, our authors consider as the most important. In fact, they try to prove that wherever the circulation is not rapid there is danger of coagulation; so it is in various veins in hemorrhoids, in compressed veins, in cases of senile gangrene, where the coagulation begins in the capillaries. They show that arteritis has nothing to do with senile gangrene. If there be an appearance of inflammation of the arteries, it depends on the coloration of the cellular tissue, due to the accumulation of altered red corpuscles in the capillaries.

6. When it is said that blood is found uncoagulated in cases of effusion due to a contusion, it is very frequently a mistake. What is taken for blood is only some reddish serosity, while the coagulated fibrin adherent to the contused tissues is not seen, unless searched for elsewhere than in this serosity.

7. The fibrin of the menstrual blood does uncoagulate when the proportion of blood is small compared to that of the increased secretion of mucus. As soon as the quantity of blood is greater than that of mucus, clots are formed. This is important as a means of distinguishing real menstruation from uterine or vaginal hemorrhage.

8. It is fibrin which forms the pseudo-membranes found on the skin or

the mucous membranes in diphtheritis, also in the bronchiæ in certain forms of pneumonia, and on the skin from the application of blisters. There is the same thing in the so-called *cantharidian cystitis, i. e.* an exudation of fibrin, which soon coagulates and forms a pseudo-membrane on the bladder and on the urethra. One of the authors has observed that it is not albumen, but fibrin, which forms this membrane. In all these cases fibrin, when coagulating, takes in the network it forms, some epithelial cells and often pus-globules or corpuscles of blood.

9. At the surface of inflamed serous membranes there is an exudation of fibrin which soon coagulates; but here the characters of fibrin differ from those it presents on the mucous membranes or on the skin, on account of the globules of pus mingled with it, and of the serosity which bathes it. In this purulent serosity fibrin exists, perhaps liquid during life, but found coagulated after death, in the pleura, the peritoneum, the pericardium, and even the arachnoid and the synovial membranes. These clots contain globules of pus.

10. The retractile power of coagulated fibrin must be studied separately from coagulation. The retraction usually is very great in a coagulum which has formed slowly. In the liquid of ascites the coagulum has less retractility than that of chyle and lymph, and the coagulum of these last two liquids retracts less than that of blood. Retraction is often prevented from taking place, on account of the adhesion of the coagulum to the walls of the vase. The fibrin of arterial blood has a greater power of retraction than that of the venous blood. The formation of the buffy coat does not depend only on the fact that coagulation takes place after the red globules have begun to sink, but also and mostly upon the expulsion of still liquid fibrin, by the retraction of the coagulum. This liquid fibrin in a short time coagulates, and as it does not contain globules is without colour. Sometimes there are two distinct layers in the buffy coat, on account of the formation of a second one during the process of retraction.

11. The consistence of coagulated fibrin is sometimes so great that M. Robin has been frequently consulted about layers of fibrin in the uterus, which were considered as being possibly the mucous membrane of the organ. This takes place particularly in dysmenorrhœa.

12. Coagulated fibrin does not become organized or vascularized, even on the pleura. There are sometimes real membranes, containing fibrous tissue, bloodvessels, etc., formed on the pleura, but they are entirely different from the fibrinous pseudo-membranes. Sometimes, in this last deposit, red striæ are found, which have been erroneously considered as bloodvessels; but the microscope shows that these striæ are formed by accumulations of altered blood-corpuscles, and that they contain none of the elements of capillaries or larger bloodvessels.

13. In the Graafian vesicles, the coagulum fills the cavity after the rupture of the vesicle; it is at first red, but quickly loses this colour. Sometimes 20 or 30 days after its coagulation, this fibrin becomes grayish, half transparent, ordinarily, however, still a little reddish by the remnant of the colouring matter of the blood. This grayish coloration belongs mostly to the corpora lutea of pregnancy, because then the resorption of the clot is more rapid than in the corpora lutea of menstruation, and what remains last is the fibrin. It is this substance, no more coloured by globules, which has been mistaken for plastic lymph by some writers. Resorption takes away the coagulated fibrin of the corpus luteum of menstruation in six weeks or two days, while the

coagulation of the corpus luteum of pregnancy is not absorbed until after the lapse of eight or nine months.

14. M. Delaharpe has found that the coagulated fibrin in the liquid of ascites may be quickly dissolved. The liquefaction seems to be more rapid in small than in large vases. In the latter, there are remnants of clots twelve or fourteen hours after coagulation, while in the former the coagula disappear in six or eight hours. One of our authors, however, has kept a clot formed in a small vase for four days. He has ascertained, after M. Delaharpe, that when such a clot has been compressed it does not dissolve as it would have done if the liquid of ascites were left in it.

15. Even the fibrin of blood after bleeding may dissolve spontaneously. M. Delaharpe and others have often observed this dissolution in the soft upper layer of the buffy coat. Béclard has found that the coagulated fibrin of the portal or splenic blood, abandoned to the action of the air, becomes liquefied in twelve hours, while that of the blood from the jugular vein loses its water and becomes desiccated.

16. The assertion made in many books, that the nitrate of potash and some other salts with an alkaline basis can dissolve fibrin, is entirely erroneous; they alter it and facilitate its decomposition, but do nothing more.

17. The pus-like liquid matter found in the centre of old clots is not pus, as many physicians have thought from a mere superficial examination. The microscope shows that it contains fibrils or granulations of fibrin, but no pus-cells. Some colourless blood-corpuscles, mixed with the fibrin-granulations, have erroneously been considered as pus-globules.

18. The presence of fibrin in the liquid of ascites may be considered as a proof that there is an inflammatory state of the peritoneum. In a case of ascites depending upon cirrhosis of the liver, with obliteration of most of the branches of the portal vein, there was no fibrin in the effused liquid. M. Bouchut has found that the quantity of fibrin in the liquid of hydrothorax decreased in three successive tappings, in proportion with the diminution of the inflammation, so that in the third there were but traces of fibrin, while the whole mass of the liquid coagulated after the first operation.

This short analysis of the important researches of Messrs. Robin and Verdeil concerning the anatomical, physiological, and pathological history of fibrin, can give but a faint idea of their value. In anatomy and physiology, the importance of descriptions is frequently more in the details of facts than in the conclusions we draw from them. We will therefore call the attention of those of our readers who desire more information relating to fibrin to the work of our authors, and we will point out what they say on the non-organization of fibrin, on its resorption, and on the characters of its fibrils and granules, as among the most interesting portions of this work.

There is an important part of the history of fibrin which, we regret to say, is not worthy of the rest in our authors' great work. It is that which relates to the origin and the uses of this principle. They state as proved that fibrin is formed in the blood by a transformation of albumen. The only fact they adduce to establish this view (which they share with many other chemists) is, that it has been found by Dr. Brown Séquard that when defibrinated blood is injected into a limb separated from the body, there is fibrin of recent formation found in the blood flowing from the veins of this limb. But this experiment does not prove that the newly formed fibrin comes from the albumen of the blood more than from the protein substances of the globules or of the tissues. The author of the experiment does not agree with Messrs. Robin and Verdeil, and he considers that this new fibrin more probably results

from a transformation of the globules. He has ascertained that the number of red globules diminishes in this case, while the quantity of albumen does not seem to change notably. He believes also that a certain amount of this new fibrin probably is furnished by the muscles, as he has ascertained that the quantity of this newly formed substance is greater when the muscles through which the injected defibrinated blood passes are thrown in contraction by galvanism.

Messrs. Robin and Verdeil have neglected to examine the important question of the uses of fibrin. They speak of it only in mentioning the opinions of various physiologists on this subject, and even their historical account, in this respect, is very short. Materials are now abundant to build up a theory concerning the physiological history of this principle. We will refer those who desire to undertake this work to a very able and learned article by Prof. F. G. Smith (in a note in the last edition of Carpenter's *Human Physiology*), in which he has tried to show that fibrin is an effete substance, which is to be destroyed, and is not destined to contribute to the nutrition of albuminous tissues. Some decisive experiments of Dr. Brown Séquard show, at least, that fibrin is not necessary for nutrition: he has found that blood, deprived of fibrin, may maintain or regenerate vital properties in muscles, in nerves, in the iris, in the spinal cord, and in the brain. By recent researches, the same physiologist has arrived at this unforeseen result, that the production and the destruction of fibrin in a day are immense. From the experiments of Lehmann concerning the blood coming from the liver, and those of Franz Simon with regard to that issuing from the kidney, showing that there is a destruction of all or almost all the fibrin which the blood conveys to these glands (except that which passes in the lymphatic vessels), it results, if we take into account the quantity which arrives at these glands in a day and the proportion of fibrin in it, that there are many pounds of this substance destroyed in that period of time. And as the proportion of fibrin remains almost invariable in the arterial blood, it results that there is a formation of many pounds of this substance in a day. We know where its destruction takes place, but we are still to learn where the greatest part of it is formed. We are aware that Gerber says he has ascertained that there is a production of fibrin in the thoracic duct; but, in admitting that he has not been mistaken, this cannot furnish many pounds of fibrin in a day, and it must therefore be produced elsewhere and in more considerable quantities.

Whether fibrin is formed from the albumen, and the albuminose of blood, of chyle, and of lymph, or from the red globules of blood (which have recently been positively proved to be a normal element of lymph, by our distinguished friend, Dr. Gubler, of Paris), or if it is formed from the elements of muscular and nervous tissues, or from all these parts at once—in all these cases there is an immense metamorphosis of either globuline, musculine, neurine, or albumen, corresponding with the very large amount of fibrin formed. These facts, with those ascertained by Schmidt and Bidder concerning the considerable quantity of juices secreted (and absorbed) in a day by the stomach, the liver, the pancreas, &c., contribute to show how immense is the transformation of matter in the blood.

Much is yet to be learned in regard to the production of fibrin; and the following experiment, which has been performed by Dr. Brown-Séquard, shows that new and unforeseen results might be obtained by those who would make researches in the physiology of this substance. Magendie found that when he bled an animal almost to death, and after having deprived it of its fibrin, reinjected at once the blood drawn out, there was more fibrin at

a second bleeding, made on the succeeding day, than at the first. Dr. Brown-Séquard has ascertained that the results of almost analogous experiments are entirely different if the successive bleedings are made at once, one immediately after the other, instead of leaving a day between them. After three bleedings no more fibrin was found in the blood, and, after the death of the animal, the blood being beaten with rods did not yield any fibrin. After an hour or two it seemed to have a kind of partial coagulation, in the shape of small jelly-like agglomerations, resulting more probably from the agglutination of the red globules with each other than from a coagulation of a very small amount of fibrin, if there was any. It had been concluded from Magendie's experiments (with which some facts observed in man by Andral and by Becquerel and Rodier, seemed to concur), that fibrin may be formed very quickly in the blood. The experiments of Dr. Brown-Séquard show that this formation is not so rapid as it was imagined.[1]

Messrs. Robin and Verdeil have studied the other protein-substances as carefully as fibrin. Concerning the principal of these substances, albumen, we will only mention a few of the facts and views related by them. They say that it is not albumen which is found in synovia, in gastric juice, in saliva, in bile, in mucus, &c., but peculiar albuminous substances. In the pancreatic juice the substance which had been considered as albumen, differs from it according to the researches of Prof. Bernard, M. Ch. Robin, and M. Moyse. When the pancreatic juice is heated, the albuminous substance it contains coagulates, as albumen would do, while if sulphate of magnesia has been added to this juice, it loses the power of giving a coagulum when heated. The serum of blood containing albumen, on the contrary, yields a coagulum as usual after it has been mixed with sulphate of magnesia. There is therefore a difference between the albumen of blood and the albuminous substance of pancreatic juice. This last substance has some of the properties of casein, but differs from it in being coagulable by heat.

The dropsical serosity is said to contain albumen; but there is a difference between this albuminous principle and real albumen. M. Ch. Robin and M. Moyse have found that this serosity has the characters of albumen when treated by heat and acids; but when it is mixed with sulphate of magnesia the liquid filtered is slightly troubled (instead of forming large white clots as albumen) by the following reagents—alcohol, nitric acid, or heat. This depends on the fact that on the filter the albuminous matter has remained, solidified by the salt. Experiments have shown that in the purulent liquid of pleurisy there is real albumen and another albuminous substance.

Messrs. Mialhe and Pressat have proposed views in relation to albumen, which are in a great measure contradicted by Messrs. Robin and Verdeil. Albumen cannot pass by endosmosis, through any membrane, according to Messrs. M. and P., but our authors show that it passes through certain membranes, as the pleura, for instance. Messrs. M. and P. think albumen to be insoluble, and to exist in a granular state in the blood; they have found that the albuminous substances are converted in the digestive tube into an amorphous or caseiform matter, which is in a transitory condition between albumen and albuminose, and can be absorbed before it becomes albuminose. This last substance is the one which, according to Messrs. M. and P., passes

[1] This physiologist had performed these experiments to ascertain if urea could be formed in blood deprived of fibrin, many chemists having said that urea is a transformation of fibrin. He has found that normal urine, containing as much urea as usual, was formed in dogs whose blood did not contain fibrin.

in the urine in Bright's disease in cases where heat and nitric acid produce only a partial precipitate, which is soluble in an excess of nitric acid. Messrs. Robin and Verdeil state that the assumption of the existence of albumen in a granular state is merely imaginary, as nothing of this kind is seen in blood. They admit, with every chemist, the existence of the new principle (albuminose) found by M. Mialhe, but they disagree with him in many respects. They state that albuminose is slightly coagulable by nitric acid, while M. M. says that it is not at all. In opposition to the view of M. M. that nutrition depends on albuminose and not on albumen, they remark that albuminose disappears from the blood in cases of disease when no food is taken, nevertheless nutrition continues, so that albumen may be employed in the nutritive metamorphosis of tissue.

Lately much has been said concerning the presence of casein in the blood of nursing and pregnant women. Our authors do not admit it to have been proved that it is real casein which has been found in these cases; they think albuminose has been mistaken for casein. Panum, of Copenhagen, has found in the blood a substance coagulating by the addition of a small quantity of acetic acid, and liquefied by an excess of this acid. Water also seems to coagulate this principle. He thinks this substance to be analogous to casein, because when it is mixed with all the principles of milk, except casein, a liquid is obtained looking and tasting like milk, and coagulating in the stomach of young animals. Our authors justly observe that such experiments cannot establish the nature of a principle. Messrs. Guillot and Leblanc have mistaken albuminose for casein; however, it is an interesting result of their researches that the quantity of this substance augments during gestation, and still more in nursing women. In disease, even in pregnant and in nursing women, it disappears from the blood. In stillborn children there is none.

M. Verdeil has discovered a very important fact concerning the various colouring matters. It was known that hematosin contains iron; it was known also that there is iron in bile; M. Verdeil has found that it is in the biliverdin, which is the colouring matter of bile, that iron exists. He has ascertained the presence of iron not only in the biliverdin extracted from bile, but also in that extracted from the placenta, in which, particularly in dogs, there is a good deal of biliverdin, as has been ascertained by M. Moulinié, a pupil of M. Robin. Besides, M. Verdeil, with M. Harley, has found iron in melanine, the black colouring matter of pigment; and M. Harley, in following the means employed by M. Verdeil, has also found iron in urrosacine, the colouring matter of urine. It is remarkable that iron, according to the discovery of M. Verdeil, exists also in the green colouring matter of plants.

Much has been published during the last ten years on the crystals of the blood. M. Ch. Robin, who had, at first, been mistaken in doubting that these crystals were formed by an albuminous substance, has lately ascertained the most interesting facts concerning their nature. Everywhere, where blood is effused, these crystals may be found; they are frequently met with in the lungs, the brain, the spleen, and the liver; they often exist in malignant tumours, in pus, &c. In a case of cancer of bone, M. Robin has found perfect blood-crystals in the substance of cancerous cells. With M. Lebert, he has seen crystals coloured in their extremities and not in their centre. This fact, and some others, led him to think that these crystals are not composed of hematosin, and that they are merely tinted by this colouring principle. Virchow, at the same time, arrived at the same view as that of M. Robin, with this difference, that he thought the crystals were formed by an albuminous

matter, while M. R. then refused to admit that albuminous substances can crystallize. Lately M. R., in a paper read to the *Société de Biologie* (in common with M. Mercier), has much advanced our knowledge on this subject. In a mass of apparently solid blood, extracted from a cyst of the liver, of the size of a filbert, the microscope showed nothing but crystals. A chemical analysis proved that these crystals differ from hematosin. M. Robin calls the crystallized substance hematoïdin, as Virchow had done already. In comparing the results of his analysis of hematoïdin with those of the analysis of hematosin by Mulder, M. R. finds, as the following table will show, that the great difference is in the existence of iron in one of these substances, and its absence in the other:—

	Hematoidin.		Hematosin.	
	1st Anal.	2d Anal.	Art. blood.	Venous blood.
Carbon	65.04	65.85	66.49	65.75
Hydrogen	6.37	6.46	5.30	5.28
Nitrogen	10.50	10.50	10.46	10.57
Oxygen	17.89	16.97	11.15	11.97
Ashes	00.20	00.20	... ...	... ...
Iron	... ...	... ...	6.66	6.45

From these analyses it seems that hematoïdin (the substance of the crystals) is hematosin, having lost its iron and an equivalent of hydrogen and oxygen. As the hematoïdin employed by M. R. for his analysis was of a deep red, and as he did not find iron in it (although he admits that there was perhaps some in the ashes), he concludes that the colouring matter of blood does not depend upon the iron it contains. We do not think he has proved this point, because, as we have often found (and so has M. Robin himself and other micrographers) quite colourless crystals of hematoïdin, entirely similar to the coloured ones, we think it very probable—as M. R. admitted in 1853, and as Virchow has tried to prove—that when the crystals are red they owe their colour to hematosin. As regards the crystals analyzed by M. Robin, they were likely coloured by hematosin, in so small a quantity that its iron was not found. M. Robin knows very well that a very small quantity of hematosin may give a deep red colour to a large mass of organic matter. However, whether M. R. is right or wrong in this respect, he seems at any rate to have proved that there is a principle which he calls hematoïdin, after Virchow, which principle has the property of crystallizing, and the composition of which is very similar to that of hematosin. He has also rendered it very probable that hematosin does not give crystals unless it loses its iron and becomes hematoïdin.

Messrs. Robin and Verdeil describe carefully, in their work, the pneumic acid, which was discovered five years ago by M. Verdeil. It exists in the tissue of the lungs, where it is formed. Our authors say it does not exist in the blood, but they merely mean that it does not circulate with the blood, as they admit that it decomposes a salt of this liquid, and to do so it must be in it. At all ages this acid is found in the lungs of man and animals. Each lung contains a few centigrammes. The two lungs of a guillotined woman gave nearly five centigrammes (one grain). Some morbid conditions of the lungs seem to increase its quantity. It is to this substance that the lungs owe their acidity. It is not combined with the substance of the lungs, but in solution in the water which imbibes this substance. It belongs to the class of principles which are not taken ready formed from the blood, but are made by the tissues. The participation of this acid in one of the most important functions of the body—that of respiration—renders its study very

interesting. It decomposes the carbonate of soda, and perhaps also the carbonates of lime and of potash, and sets free the carbonic acid which is partly at once expelled through the bronchiæ. Thence, the formation of pneumate of soda, a salt which M. Verdeil has discovered in the blood.

The pneumic acid forms beautiful crystals belonging to the oblique rhomboïdal type. They are colourless, transparent, and from one-quarter to two centimetres long; they are generally disposed in rays emanating from a centre.

Among the immediate principles which have been the objects of original researches by Messrs. Robin and Verdeil, some of the most important are those of the urine. From their study of the constituents of this liquid they conclude that many of these do not exist in it in the state in which they are said to. This will be explained hereafter. The chapter on uric acid and its salts is one of the most interesting. Many of the statements in works on urine and in treatises of organic chemistry concerning uric acid, and even its quantity and its formation, belong mostly to the history of the urates. If, in the formation of these salts, the acid comes from organic substances, while the base is taken from principles of mineral origin, it is nevertheless certain that the acid is never free in the economy, except in the urinary tubes and the urine, and therefore outside of the bloodvessels in which only urates are found. Even in urine the presence of free uric acid is only accidental or pathological in man and in the carnivora and omnivora. Not only is uric acid the most frequent constituent of urinary calculi, but it has been found in biliary calculi. Crystallized uric acid is very frequently found in the urine in gout, in articular rheumatism, and in many inflammatory affections. But then it is very probable, as Lehmann has tried to prove, that this acid is separated from its salts by lactic acid. Uric acid in this case crystallizes only after the urine has been expelled from the bladder. Crystals of this acid are never formed in the bladder except in the uric gravel, a disease characterized particularly by this rapid crystallization of the uric acid.

In some accidental circumstances, such as the use of exciting substances, as coffee either very strong or in large quantity, in persons who are not accustomed to it, there is a deposit of crystals of uric acid in the urine. This is the case also in persons who have drunk champagne or other effervescent wines. It has been said that there is no uric acid in diabetic urine; but M. Rayer has shown, on the contrary, that crystals of this acid are frequently found in the urine of diabetic patients. In embryos, the free uric acid is found only after the formation of the urinary organs, and probably a long time after this formation. The constant presence of uric acid in urine is a symptom either of a disease of the kidney or of some other affection. M. Becquerel says that there is 0.398 to 0.526 parts of uric acid out of 1000 parts of normal urine, and Lehmann asserts that one gramme and ten centigrammes (22 grains) a day is the quantity of uric acid, when there is a mixed food; but these assertions mean only that there is in urine a certain amount of urates from which it has been possible to extract the stated quantity of uric acid.

Liebig admitted that there was uric acid dissolved in urine by phosphate of soda, but this is not exact; it is urate of soda which exists, and not free uric acid. The acidity of urine does not depend upon uric acid, but mostly upon other acids and the acid phosphate of soda. The chemists and physicians who have stated that the grayish or rose deposits which are formed in urine are simply uric acid mixed with a little animal matter, and not urates of ammonia or soda, have been mistaken. M. Donné has proved that

crystallized uric acid cannot be dissolved by urine, while these deposits, like the urates, may be dissolved. Other facts prove also that uric acid is not free in these deposits. Proust was the first who gave this demonstration. Marvis Wilson, our distinguished countryman, Dr. Frick, of Baltimore, and M. Ch. Robin, have sometimes seen uric acid in the shape of dumb-bell crystals. A great many forms of crystallized uric acid have been represented by Donné, by Dr. Frick, and by Messrs. Robin and Verdeil in the atlas of the work we are reviewing.

The neutral urate of soda exists in the urine of Carnivora; it exists also in the urine of Herbivora when they are deprived of food. It has been found in blood in gout (Garrod). The deposit in urine of persons attacked with intense fever is neither uric acid nor the urate of ammonia, but urate of soda and a little urate of lime, with traces only of urate of ammonia. It is said by chemists that the free uric acid and that of the urates are formed by combustion from neutral nitrogenous matters; but this theory, though generally admitted, is in opposition to the fact that uric acid, free or in urates, is absent in the urine of herbivora, except when they are deprived of food, and it is known that in the mass of vegetables that they eat there is almost as much nitrogenized substance as in the food of carnivora.

The same mistakes have been made respecting hippuric acid as with regard to uric acid: frequently the hippurates have been taken for this acid. It does not exist free in the blood, and its presence in urine is only accidental or pathological. Lehmann thinks that the excessive acidity of urine in fever is due to an excess of hippuric acid. M. Robin has found a deposit of hippuric acid in a vigorous man, who did not take exercise and used highly nitrogenized food; the quantity of this acid increased after he had taken excitants like coffee, wine and other alcoholic liquors. Hippuric acid may be found in alkaline urine, as Messrs. R. and V. have ascertained in a specimen furnished by a dog. Bouchardat has found hippuric acid in the urine of two patients, and he imagines that the symptoms in these two cases were striking enough to entitle him to give the name *hippuria* to their affection. M. Bouchardat will not find, we think, many persons to admit with him the existence of this pretended peculiar affection in a sceptical age like ours, when Addison and his supporters cannot obtain a general acknowledgment of the existence of a peculiar affection characterized by bronzed skin and disease of the supra-renal capsules, although they have thirty times as many cases as M. Bouchardat, and numerous experiments upon which to ground their opinion. The hippuric acid discovered in blood by Messrs. Verdeil and Dolfuss was probably combined with soda; and Messrs. R. and V. show that there are probably always hippurates in the blood. Liebig thought he had proved that there is always free hippuric acid in the urine of man; but, as Messrs. Robin and Verdeil justly remark, as he employed chlorhydric acid to obtain the hippuric acid, he very likely produced the decomposition of a salt. Prof. Bernard says that the hippurates disappear from urine of herbivora when they are deprived of food. Messrs. R. and V. have found a notable quantity of hippurate of lime in the urine of horses.

There are in the urine of man two acids resembling hippuric acid, which seem to have been described for the first time by Mr. W. Marcet, and afterwards by Messrs. R. and V. One of these acids forms crystals belonging to the type of the rhomboidal oblique prism. It is a weak acid, soluble in ether, alcohol, and boiling water, but insoluble in cold water. When heated it gives a peculiar smell different from that of the hippuric acid. The other new acid, before crystallization, forms drops having a resinous appearance,

which, after 24 hours, and sometimes later, crystallize in such a way that from the centre of each drop many crystalline needles radiate. These needles are soluble in ether and alcohol, but not in water. When heated they give no aromatic odour.

Messrs. Robin and Verdeil attribute the acidity of urine, at least in man and dogs, principally to the acid phosphates of soda and of lime. Morin had already ascribed to this last salt, and not to lactic acid, the acidity of the urine. It is probable that this acid phosphate is formed from the basic phosphate, giving a part of its basis to some of the acids of the urine. Another salt contributes to the acidity of urine: it is the acid phosphate of soda. Messrs. R. and V. have ascertained that normal urine contains together the neutral and the acid phosphates of soda. They explain very rationally why the urine of herbivora contain a much smaller quantity of phosphates than that of man and of the carnivora, and why it is the reverse as regards the carbonates. The salts whose acids are the tartaric, the malic, the oxalic, etc., are abundant in the food of herbivora, and they are easily transformed into carbonates, which are excreted by the urine; while in carnivora the food (meat, corn, etc.) being rich in phosphates, and containing but a small amount of salts capable of being transformed into carbonates, yields to the urine more phosphates than carbonates. It is a very interesting fact, that while the acidity of urine chiefly depends on acid phosphates, the alkalinity of the blood depends partly on basic phosphates. Although the alkalinity of the blood is ordinarily chiefly due to alkaline carbonates, they may be replaced by phosphates, as Liebig has already shown. It is this possibility of the reciprocal substitution of phosphates and carbonates in the blood which explains why in man the alternations of animal and vegetable diet is not injurious. The food of different animals varying very much, their blood must also vary much. This is fully proved by some experiments of M. Verdeil, who has analyzed comparatively the ashes of the blood of various animals fed differently. The quantities obtained by these analyses cannot be considered as absolute, but as the means employed in the various analyses were exactly the same, the comparison of the different results is a valuable one. The blood of oxen, being taken as the type of that of herbivora, had only 3 per 100 of phosphates (of soda and potash), while the blood of a dog fed on meat contained 12 per 100 of the same phosphates. The ashes of the blood of the same dog, fed on potatoes, contained only 9 per 100 of phosphates, and the ashes of human blood have about 10 per 100.

Changes in the biliary and the urinary secretions, according to the kind of food, are as frequent as the above-mentioned changes in the blood. Messrs. R. and V. insist upon the demonstration that the various conditions of acidity and of alkalinity of the urine, corresponding with variations in food, &c., depend chiefly on the state of the phosphates contained in the urine. The phosphates of soda (the alkali and the acid) having but very little stability, are probably the principal causes of the alkaline and acid states of the urine.

A complete chemical, microscopical, and physiological history of urea is given by Messrs. R. and V. They endeavour to show that chemists have not proved that urea, as they maintain, is a product of the combustion of nitrogenized substances. We think they are right in this respect, and we have already mentioned an experiment of Dr. Brown-Séquard, which seems to demonstrate that urea may be formed in blood deprived of fibrin. Messrs. R. and V. have no difficulty in showing that chemists have no direct fact upon which to ground their opinion, and that they content themselves with unproved assertions. The recent researches of M. Béchamp, which show that albumen, in

presence of certain chemical reagents, and at a temperature very much higher than that of the animal body, may be transformed in urea, do not prove —although M. Dumas admits it—that urea results from a transformation of albumen in the animal economy. The facts observed by M. Béchamp only show that albumen, *in certain conditions*, is transformed into urea; they do not prove that *in entirely different conditions*, the same thing takes place. We believe that no physiologist or chemist has tried to prove that butyric acid in milk is the product of a transformation of fibrin, because M. Wurtz has found that in certain conditions this transformation takes place. We must acknowledge, however, it is possible that in the living blood urea may result from the transformation of albumen or some other nitrogenized substance; but we repeat, that proofs of its being so have not yet been given. The experiments of Messrs. Bernard and Barreswil, which have become so interesting since the publication of Frerich's views on uræmia, are mentioned at length in the work under review. When the kidneys have been extirpated, according to these physiologists the intestinal secretions increase in quantity, and instead of being intermittent (taking place only during digestion), they continue without interruption. A few hours after nephrotomy, this increased secretion is manifest, and at the same time ammoniacal salts are found in the intestinal liquid, although it is still acid and has not lost its digestive powers. They think that urea remains unaltered in blood, and that as soon as it is secreted in the intestinal canal it is dissolved in fluids in which fermentations are constantly going on, and it ferments and is changed into ammoniacal salts. They have ascertained that urea introduced into the digestive canal of healthy dogs, soon disappears transformed into ammoniacal salts. In the intestinal tube of a recently dead animal this takes place also, but more slowly. The experiments of Prévost and Dumas had shown that urea is found in the blood of animals after the extirpation of their kidneys, but it remained to be explained why this principle existed there evidently, only after about three days. The experiments of Messrs. Bernard and Barreswil give this explanation. They show that as long as the animals remain strong, urea is thrown off by the intestinal secretions, but when the animals have become weak, urea is expelled only in small quantity, and then quickly accumulates in the blood.

Messrs. R. and V. describe at length the various forms of crystallization of urea and of its principal salts, and they have admirably represented these crystals in their atlas.

There are two substances in the urine, which, like urea, are deserving the attention of physicians—we mean creatine, and creatinine. One of them, creatine, exists not only in urine and in muscles, but also in blood, where it has been discovered by Messrs. Verdeil and W. Marcet. It is formed in muscles, passes into the blood, and thence is thrown out through the kidneys. We will remark about this substance, that it is very remarkable what little spirit of original investigation there is among physiologists and physicians. Here is a substance which exists normally in the urine—what becomes of it when the renal secretion is suspended? After Messrs. Prévost and Dumas had extirpated the kidneys to search for urea in the blood, twenty experimenters have followed them and repeated their experiments, but the urinary secretions contain many other principles (creatine, creatinine, uric acid, hippuric acid, &c.), and no one looks for them. There are numerous young physicians who could solve the questions concerning these principles, as well as a multitude of other questions, if they would but direct their attention to them.

Creatinine has not been discovered yet in muscles, where, very likely, it is

formed with creatine. It has been found in blood by Messrs. Verdeil and Marcet, and it exists in urine. Beautiful plates, representing creatine and creatinine, are given by Messrs. R. and V.

Among the substances contained in urine, many chemists, after Berzelius, place lactic acid; but it seems to exist there only accidentally. It exists normally in gastric juice. It has been said (Bouchardat and others) that lactic acid is not secreted in the stomach, but formed there by the transformation of glucose; but Prof. Bernard has shown that most of the glucose is absorbed before its transformation into lactic acid; and he says, also, that when only vegetable food, containing a great deal of starch, has been given to an animal, the chyme is alkaline, and not acid as it should be if glucose had been transformed into lactic acid. Lactic acid appears to be formed in the muscles. The researches of M. Bernard and those of M. Verdeil have shown that glucose, coming from the food or from the liver, is quickly transformed into lactic acid in the blood, during its passage from the liver to the lungs, through the heart. In the lungs, it is probable that the lactic acid, with the pneumic acid, decomposes the carbonate of soda, renders the carbonic acid free, and forms the lactate and the pneumate of soda. Lactic acid has the power to take the various alkalies combined with carbonic acid; so it is that in the stomach, according to Bernard and Barreswil, and to Melsens, the lactic acid of gastric juice decomposes the alkaline carbonates.

The action of lactic and of pneumic acids on carbonates is dwelt upon in many places by Messrs. Robin and Verdeil, against the views of chemists admitting that most of the chemical changes in the body take place by a *combustion.* We might say that the predominant idea with our authors while writing their work is, that the animal body is not a fire-place where scarcely any process but combustion takes place chemically. They maintain that usually the chemical phenomena which occur in the animal body are much more complex than those imagine who believe that combustion is the principal process. They think that some of the phenomena are, on the contrary, more simple than certain combustions. For instance, they suppose that the transformation of albumen into musculin, in muscles, takes place by a mere catalysis, muscles being the catalytic agent. We might give a great many examples to show their views in this respect; we will merely say that they suppose that the kidneys act by their catalytic property on the blood, to form uric and hippuric acids; that the mammary glands act by their catalytic property on the blood to transform albuminose into casein, and glucose into milk-sugar; that the blood-corpuscles have the catalytic property of transforming albumen into globulin, &c. We are afraid that Messrs. R. and V., who are right in almost everything they say against the occurrence of combustion in the human body, have gone much further than the facts warrant in admitting that catalysis is so frequent in the body.

According to most chemists, the theory of respiration and that of animal heat are based upon the hypothesis of a direct combination of oxygen with carbon and hydrogen. They have only looked at the fact that there is oxygen absorbed, and carbonic acid and water expelled. They imagined that oxygen in the blood, or in the tissues, was constantly burning some substance. An eminent chemist says: "The oxygen of the blood, while passing into the capillaries, destroys by a real combustion the tissues that have become unfit for life; the carbon and the hydrogen of these tissues, at least in part, are changed into carbonic acid and water to be expelled by the lungs. But what form shall nitrogen take? The most simple combination it could form would be ammonia; but as this gas cannot exist free in the economy, *nature*

has had to modify it. It has been sufficient for this to put the ammonia in contact with carbonic acid, and to eliminate from this combination the elements of water for the production of urea. This principle being inert and soluble in water, can pass without the least danger into the torrent of the circulation, and be taken and rejected by the kidneys. Such is the *origin of urea in the economy.* It may be seen that it is in some respects a *burnt body resulting from the oxidation* of the nitrogenized matter of the body."

It is evident that these are only assertions; but chemists have not taken the trouble to give proofs of their views. They say, for instance, that when oxygen combines with carbon, it produces a certain quantity of heat, and so also when it combines with hydrogen; now, it being known how much carbonic acid and how much water is eliminated in a given time, and how much is absorbed in the same time, they find that from seven to nine-tenths of the animal heat is produced in this way. But they do not take the trouble of proving that there is in the body really a direct combination of oxygen with carbon and with hydrogen. Nor do they take into account the production of heat which results from the immense number of chemical metamorphoses which are constantly going on in the blood and in the tissues. The time has come, however, when the discovery of some decisive facts will oblige chemists to abandon their theories; we will mention only the two following facts: M. Bernard has ascertained that there is an increase of more than one degree Fahrenheit in the blood during its passage through the liver; Dr. Brown-Séquard has found that the temperature of the body rises about 2° or 3° Fahr. during asphyxia.

Before concluding this review of the eminently useful work of Messrs. Robin and Verdeil, we must say that it is enriched by a splendid atlas of 45 plates, each of which contains from 15 to 20 figures, representing all the crystalline and other forms of the Immediate Principles. There is no other work in which the principles of the urine have been more completely represented. Many of the plates are coloured, and all the drawings, except a few, have been executed by M. Ch. Robin himself, and by M. Lackerbauer, one of the most able artists of France. E. B—S.

BIBLIOGRAPHICAL NOTICES.

ART. XIII.—*A Claim of Priority on the Discovery of, and also the Naming of the Excito-Secretory System of Nerves.* By HENRY FRASER CAMPBELL, M. D., of Augusta, Georgia, U. S. A., Member of the American Medical Association, etc. etc. 8vo. pp. 16.

As early as May, 1850, Dr. Campbell, in an essay on the influence of dentition in the production of disease, read before the Medical Society of Augusta, Georgia, and published in the *Southern Medical and Surgical Journal* for June of the same year, in explaining the "two orders of phenomena which occur during the period of dentition, viz., the *convulsive*, and the *secretory*," refers the first to the excito-motory, and the second to an *excito-secretory* function of the nervous system; in the following words:—

"Let us inquire how far these phenomena are dependent upon dentition; and analogy with the excito-motory system will much assist us in our argument. We have seen that local irritation can, through this system, produce convulsions, by the reflex function of the nerves; the sensitive branches of the fifth pair becoming excitory to the motor-spinal nerves; and so, we may justly infer, do these same branches, under certain circumstances, become *excitor* to the *secretory* filaments of the sympathetic, distributed so abundantly to the intestinal canal, by a transmission of this irritation through the various ganglia with which it is connected."

In the essay just referred to, we find the excito-secretory function of the nervous system—there for the first time distinctly indicated—very fully discussed and elucidated, while the fact, that a continuance of the irritation, through the medium of that function, alters, finally, the character of the secretions furnished by the several organs implicated in the irritation, is formally adverted to.

In May, 1853, Dr. C. presented to the American Medical Association an essay on the subject of typhoid fever, which was published in the sixth volume of the *Transactions* of that body. In this essay he assumes that all typhoidal diseases are manifestations of disease through the agency of the secretory system of nerves.

"While engaged," he remarks, in the preparation of the essay, "my attention was called to certain experiments performed by Mons. Claude Bernard, of Paris, together with his deductions therefrom. On examination, finding that they contained what, at the time, appeared to me the germ of a theory similar to mine, recorded in June, 1850, though M. Bernard refers to them as a set of phenomena *identical* with those occurring in the cerebro-spinal system of nerves, denominated excito-motory by Dr. Marshall Hall, while I had deduced this *excito-secretory* system (in 1850), saying, 'Analogy with the excito-motory system will much assist us in our argument;' and further, inasmuch as this distinguished gentleman's report presented itself to my mind at that time, somewhat in the form of an announcement," I deemed it advisable to record before the National Medical Congress, in a brief memoir, my claim to priority, and to protest against the palm of originality being awarded to M. Bernard.

Which memoir, entitled "On the Sympathetic Nerve in Reflex Phenomena," was published in the sixth volume of the *Transactions of the American Medical Association*, for the year 1853.

In this memoir Dr. C. remarks as follows, quoting the first sentence from his essay published in 1850:—

"'In conclusion, let us define the position which, at the end of our investigation, we feel warranted in assuming. It is the following: that in the anatomy

and physiology, as well as in the dependent analogies of the process of dentition, we find ample ground for the opinion that the diseases pertaining to this period may be dependent, and in many instances, are entirely so, upon the local irritation attending the process, being transmitted through the cerebro-spinal system of nerves, producing convulsive diseases in the motory apparatus, or through the sympathetic, causing derangements of the secretory organs, particularly of the alimentary canal, by the sway which it exercises over the arterial system from which these secretions are eliminated.'"

"In the above brief quotation, it will be observed, that the doctrine of the reflex function between the cerebro-spinal and sympathetic systems is plainly enunciated, and not only is the physiological fact noted, but we there also have surmised the transmission of permanent irritation, or of paralysis from the cerebro-spinal to the sympathetic system, giving rise to various aberrations in nutrition and secretion. This opinion we have held for several years, teaching to our classes that there existed between the cerebro-spinal and the ganglionic system of nerves, a relation similar to that between the sensitive and motor branches of the cerebro-spinal, and which Marshall Hall terms *excito-motory;* while we have termed that between the cerebro-spinal and sympathetic systems, *excito-secretory.*"

The same views were reiterated by Dr. C. in a review of M. Trousseau's lecture on the effects of dentition in nursing children, contained in the 13th volume of the *Southern Medical and Surgical Journal*, No. I., published January, 1857.

We have thus a complete chain of evidence in support of the prior claim of Dr. Campbell to the discovery of the excito-secretory function of the nervous system—first distinctly named by him—and the public enunciation of his views in respect to this function in juxtaposition, and contradistinction to the excito-motory function as discovered and announced by Dr. Marshall Hall, of London.

Notwithstanding the repeated publication of the views of Dr. C. on this point, since the early part of 1850, in a professional periodical of extensive circulation, and exchanging with all the medical journals in this country, and with many of those of Europe; in the *Transactions* of one of the most authoritative and dignified medical associations of the United States, their being noticed formally in several of the leading medical journals of America, and, in pamphlet form, distributed widely to scientific men on both sides of the Atlantic, Dr. Marshall Hall, without either directly alluding to the fact that, seven years previously, Dr. C. had pointed out, in express terms, the excito-secretory nervous function, with a clear recognition of its relations to pathology, through which, indeed, he has mainly deduced its physiology, makes, in the *London Lancet*, for March, 1857, the following announcement:—

"In a memoir read at the Royal Society, in February, 1837, I announced the existence of an *excito-motory* system of nerves. I believe I may now announce a system or sub-system of *excito-secretory* nerves, not less extensive."

In his subsequent remarks, Dr. H. refers to the experiments of M. C. Bernard, of Paris, as confirmatory of his views in respect to the new nervous function of which he treats.

"The most remarkable proof," he says, "of the doctrine which I am endeavouring to unfold is furnished by the brilliant discovery and skilful experiments of M. Cl. Bernard."

He here refers to the well-known experiments of this gentleman on the pneumogastric nerve in its relation to the secretions of the liver, published in his lectures on experimental physiology, during the winter session of 1854–55.

In a former part of his communication Dr. Hall remarks:—

"Henceforth the Diastatic Nervous System must be divided into two sub-systems:"

"I. The excito-motory."

"II. The excito-secretory."

"The former is extended to the entire muscular system, the latter is diffused over the general system as the blood is diffused over the system."

Again, in reference to the *Pathological* relations of the excito-secretory system, he remarks:—

"The pathology of the excito-secretory sub-system remains to be investigated and traced. A partial keen current of air, falling on *any* portion of the skin, may induce inflammation in *any* susceptible internal organ. An extensive burn or scald is apt to produce pneumonia."

In conclusion, Dr. H. remarks:

"My present object is only to draw the merest sketch of this vast subject, which demands a most extensive and cautious series of experiments and observations. The efforts of many laborers, through many years, will be required fully to develop the two sub-systems of the diastaltic nervous system."

From the general manner and tone of the communication of Dr. Hall, it must be very evident that he desires his announcement of the excito-secretory nervous system of nerves should be received as that of a discovery of which he alone is the author. And yet, whoever will take the trouble of comparing the several communications published by Dr. Campbell, since May, 1850, with the one of Dr. Hall, to which reference has just been made, must acknowledge that the very same views of which the latter claims to be the author, and the same pathological inferences deduced by him from those views, were announced by the former many years previously.

Now it cannot but be looked upon as a somewhat surprising circumstance that no one of the repeated publications of Dr. Campbell, setting forth his views in reference to the existence of an excito-secretory system of nerves, and their agency in the production of certain pathological phenomena; that no one even of the many notices of these views that have appeared in standard medical journals, during the last seven years, should ever have met the eye of Dr. Hall, more especially when we consider the efforts that Dr. Campbell has made to give to one, at least, of those publications a somewhat extended spread, and to direct to it the notice of the leading physiologists of Great Britain. It is, nevertheless, very possible that such may have been the case. We can hardly accuse a scientific gentleman, occupying the high position that Dr. Hall does, of so contracted a spirit of jealousy as would prompt him intentionally to overlook the undoubted claims of an American physician to a discovery, which, if it shall be finally established by experiment and observation, is as brilliant and important as his own in reference to the excito-motory system of nerves.

We feel very confident that now the claims of Dr. Campbell have been laid before him in so clear, candid, and kindly a manner as they are in the publication before us, Dr. Hall will promptly acknowledge that, in his supposed discovery of a system or sub-system of excito-secretory nerves, and in its applications to pathology, he has been anticipated by his American contemporary.

In the mean time, we hold it to be our duty to sustain Dr. Campbell in his claim to priority, which we believe no one will deny has been most triumphantly established.

Since the foregoing notice was written and in print, we have received the number of the London *Lancet* for May, 1857, containing some remarks by Dr. Hall, in regard to Dr. Campbell's claim. In these are freely and candidly conceded to Dr. C. the priority of the *idea* and designation of an excito-secretory nervous action. The following are the concluding sentences of the remarks referred to:—

"I arrive at this conclusion: the *idea* and the *designation* of an excito-*secretory* action belong to Dr. Campbell, but his details are limited to pathology and observation. The elaborate experimental demonstration of reflex excito-secretory action is the result of the experimental labours of M. Claude Bernard.

"My own claim is of a very different character, and I renounce every other. It consists in the vast *generalization* of excito-secretory action throughout the system.

"There is, perhaps, not a point in the general cutaneous surface in which tetanus—an excito-*motor* effect—may not originate; there is scarcely a point in which internal inflammation—an excito-*secretory* effect—may not be excited.

"*Every* point of the animal economy is in *solidarité* by a reflex excito-secretory action with every other!

"I here observe that this excito-secretory action cannot be designated *diastaltic*. It is certainly *dia-energetic;* but it does not assume the form expressed

by the Greek term στελλω. A new designation is required, and I propose at once the plain and simple one of *dia-centric*. Thus the in-going nerves are *centripetal;* their influence traverses the spinal marrow, and is *dia-centric;* it is reflected along *centrifugal* nerves.

"One remark more. The diastaltic system extends to the internal muscular organs, as well as the external. I would therefore speak of—

"1. *External diastaltic action;* and of

"2. *Internal diastaltic action.*

"The former has been amply elaborated and traced in my various publications; the latter remains for new investigation.

"The former applies to all orifices and exits, and all tubular structures leading to them; the latter to all internal muscular organs—the heart, the stomach, the intestines, &c.

"I trust Dr. Campbell will be satisfied with my adjudication. There is in the *excito-secretory* function, as applied to pathology, an ample field of inquiry for his life's career, and it is indisputably—HIS OWN. He first detected it, gave it its designation, and saw its vast importance." D. F. C.

ART. XIV.—*Reports of American Institutions for the Insane.*

1. *Of the New Jersey State Asylum, for the year* 1856.
2. *Of the Pennsylvania Hospital for the Insane, for* 1856.
3. *Of the Pennsylvania State Hospital, for* 1856.
4. *Of the Western Pennsylvania Hospital, for* 1856.
5. *Of the Mount Hope Institution, for* 1856.
6. *Of the North Carolina State Asylum, for* 1856.
7. *Of the South Carolina State Asylum, for* 1856.
8. *Of the Indiana State Hospital, for* 1856.
9. *Of the Illinois State Hospital, for* 1856.
10. *Of the Missouri State Asylum, for* 1856.
11. *Of the California State Asylum, for* 1855.

1. FROM the very brief report by Dr. Buttolph, of the New Jersey Lunatic Asylum, we make the following extracts:—

	Men.	Women.	Total.
Patients in the asylum, Dec. 31, 1855	107	126	233
Admitted in course of the year	80	88	168
Whole number in course of the year	187	214	401
Discharged, including deaths	63	75	138
Remaining, Dec. 31, 1856	124	139	263
Of those discharged, there were cured	31	62	93
Died	13	14	27

"The number of deaths was comparatively large, from its frequent occurrence from general exhaustion and consumption, in chronic cases; about two-thirds of the whole number being of this character. The general health of the inmates has otherwise been unusually good through the entire year.

"Forty-nine more cases have been under care during the past, than in any preceding year."

	Men.	Women.	Total.
Whole number of patients from opening	513	551	1,064
Discharged, recovered	192	219	411
Died	71	69	140

The report is embellished with an engraved view of the asylum, taken since the two new wings were erected.

2. The abstract of the medical history of the Pennsylvania Hospital for the Insane, for the year 1856, is as follows:—

	Men.	Women.	Total.
Patients at the beginning of the year . .	120	110	230
Admitted in course of the year . . .	74	92	166
Whole number	194	202	396
Discharged, including deaths . . .	84	88	172
Remaining at the end of the year .	110	114	224
Of those discharged, there were cured .			89
Died	8	14	22

Causes of Death.—Typho-mania, 7; softening of brain, 3; tubercular consumption, 3; chronic diarrhœa, 3; congestion of the brain, 1; suicide, 1; dysentery, 1; "gradual exhaustion, induced by high mental excitement, want of sleep, and a steady refusal of food," 3.

The amount of matter in this report, which we wish to lay before our readers, is so great, that we must quote with as little comment as possible.

"Of the admissions during the past year, several were of a peculiarly interesting character. Among these may be noted a little girl scarcely five years old, two sisters from this State, two sisters from South America, and a gentleman and his wife, none of whom were known to have a hereditary tendency to insanity"

The first case alluded to in the following extract is interesting in its medico-legal relations:—

"A case of highly-marked mania was received, in the early stages of which the obscurity of the symptoms led to a criminal conviction, but which, in their ultimate development a few weeks afterwards, were so striking—ending, indeed, in death—that no one could well doubt the existence of the disease at the time of trial. A few cases have also been under care, in which, although the evidences of the disease were obvious enough to those familiar with insanity, a careful judicial examination and subsequent developments seemed necessary to satisfy all of the propriety of their detention." * * * * *

"While there may be, on one side, an apparent desire to make out individuals to be sane who are really not so, there seems also to be a growing disposition, in some parts of the country, to convert into insane men those who have not the slightest grounds for the benefit of such a plea.

"Important as it is, on every account, that cases of insanity should be subjected to proper treatment in their early stages—and this, all experience has conclusively shown, can rarely be attained, except in institutions specially provided for the care of those afflicted with this malady—still, it is equally desirable that none but proper cases should be received, and especially so that persons guilty of crimes against society should not, without good cause, be relieved from any past responsibility for their acts, on the ground of a mental condition which deprived them of all power of self-control. The plea of insanity is often a most righteous one, and altogether too humane in its character to have its just influence jeopardized by being used by those whose only claim to be shielded by its benevolent influences consists in the atrocity of their offences or the enormity of the frauds they have perpetrated on the community. Gigantic frauds and startling crimes do not constitute insanity, nor are they to be regarded as the symptoms of the disease; and if our courts should once begin to permit such doubtful associations, the sound common sense of the community, it is to be hoped, will soon decree that for that form of insanity—no matter whence it derives its title—the most efficient treatment will be found in some well-conducted penal institution.

"To the medical profession belongs the high honour of having, on numerous occasions during the last half century, interposed the plea of insanity successfully to save individuals who were really irresponsible for their acts, and who otherwise must have suffered the ignominy and punishment of felons. The justice and extreme importance of this plea, to those who are really insane, make it incumbent on the same profession, and especially on those who have the immediate guardianship of that afflicted class, to take care that they should

not be deprived of what rightfully belongs to them, and, at the same time, lead them to frown upon every attempt, from whatsoever quarter it may come, to put crime on a footing with disease, or to confound one of the heaviest of human afflictions with the recklessness, extravagance and depravity of our race. Even when conviction is avoided on the ground of insanity, there are certain forms of the disease that seem to require that permanent seclusion should be one of the results of such an acquittal. Where life has been taken or attempted, and a homicidal propensity has been shown to have existed, there can scarcely be a greater judicial farce, or a scene better calculated to bring legal proceedings into disrepute, than that an individual, through whose instrumentality some one's life had been lost or seriously jeopardized, should, a short time after such a trial, be seen walking in our midst, as openly as before the occurrence."

	Men.	Women.	Total.
Whole number of patients since opening the hospital	1,541	1,377	2,918
Discharged, cured	752	673	1,425
Died	177	137	314

"The ratio of the recoveries on the admissions for mania amounted to 59 per cent.; for melancholia, to 51 per cent.; for monomania, to 42 per cent.; for dementia, to 11 per cent.; and these last were nearly all of that acute form which is occasionally met with. Of those registered as delirium, only 9 per cent. recovered. The total number of recoveries amount to 48 per cent. of all the admissions, or 52 per cent. of the discharges."

"The mortality from mania is 9 per cent. on the admissions for that form of insanity; 8 per cent. from melancholia; 3 per cent. from monomania; 38 per cent. from dementia; and 81 per cent. from delirium. The mortality on the total of admissions is 10 per cent."

"The use of opium is recorded as the cause of insanity in four men and six women. It probably has affected more cases, but these were unquestionable. There is reason to fear that this most pernicious habit is on the increase. Five cases were clearly attributable to the use of tobacco. Common as is the use of this article, in some of its various forms, its injurious influence on many constitutions is much more serious than is commonly supposed, and not unfrequently the cause of exceedingly troublesome and obscure nervous affections, which cannot be cured whilst its use is persisted in. The effect on many insane patients is so striking, that an intelligent attendant is often able to say, without difficulty, when it has been used to any extent."

By comparing the whole number of the insane persons of certain professions and occupations admitted into the Pennsylvania Hospital for the Insane, and the Pennsylvania State Hospital at Harrisburg, with the whole number, according to the last census, of persons who in Pennsylvania were engaged in those professions and occupations, Dr. Kirkbride finds the proportion of the insane to be relatively as follows:—

"Farmers	1 to every 977	Lawyers	1 to every 178
Merchants	1 " 267	Clergymen	1 " 557
Clerks	1 " 336	Teachers	1 " 578"
Physicians	1 " 239		

"There is also another interesting fact made out pretty clearly, and that is, that any respectable occupation is better for mental health than having none at all; the number of admissions of males here with 'no occupation' being as high as 212, and, without doubt, showing a higher proportion, relatively, than any of the callings referred to in the table."

By a comparison of his patients with the inhabitants of the State, in reference to age at the origin of insanity, Dr. K. arrives at the following results:—

Under 10 years	1 case for	92,817	persons.
Between 10 and 15	1 "	5,035	"
" 10 " 20	1 "	1,445	"
" 15 " 20	1 "	801	"

Between 20 and 30	. . . .	1 case for	387	persons.
" 30 " 40	. . . .	1 "	398	"
" 40 " 50	. . . .	1 "	484	"
" 50 " 60	. . . .	1 "	572	"
" 60 " 70	. . . .	1 "	1,032	"
" 70 " 80	. . . .	1 "	1,521	"

The subscriptions for the new hospital building amount to $209,000. The first stone of the building was laid on the 7th of July, and the corner-stone was formally laid on the 1st of October, 1856. Upon the latter occasion, addresses were delivered by Professor George B. Wood and others.

	Men.	Women.	Total.
3. At the Pennsylvania State Lunatic Hospital, the number of patients, on the 31st of December, 1855, was . . .	138	112	250
Admitted in course of the year . . .	74	55	129
Whole number	212	167	379
Discharged, including deaths . . .	82	64	146
Remaining, Dec. 31, 1856	130	103	233
Of those discharged, there were cured .			25
Died			32

Died from exhaustion of chronic mania, 16; dysentery, 9; inflammation of the lungs, 2; erysipelas, following inflammation of the throat, 2; suicide, 1; chronic bronchitis, 1; acute mania, 1.

One of the patients, the death of whom is ascribed to chronic mania, had a disease which corresponded in all essential respects with the disease of the supra-renal capsules, as described by Dr. Addison, of London. "The skin of the face and hands, particularly, was of a deep coppery-brown; her body inclined to emaciation, but the bodily functions were generally regular. Her constant complaint was her great weakness; but neither tonics nor malt liquors, which she was constantly craving, seemed to have any beneficial influence." There was no autopsy in her case.

"During the early part of the year," remarks Dr. Curwen, "our household enjoyed an unusual degree of health; but, on the 1st of July, an epidemic dysentery, which prevailed extensively in the neighbourhood, made its appearance, and continued for six weeks, when it disappeared almost as suddenly as it had appeared. Eighty-four patients and fourteen officers and attendants were attacked; and nine patients and one attendant died. Many of the cases were severe and very protracted, and in several cases death was clearly to be attributed to our inability to keep up a systematic medication, from the obstinate refusal of the patient to take the means prescribed."

"During the last quarter of the year another epidemic extended from the community around us to our household, and presented many cases of an anomalous character. Commencing as a violent inflammation of the fauces, in several cases it extended so as to include all the glands of the throat and mouth, with the tongue, so as entirely to prevent articulation and even deglutition, but gradually subsiding in the course of a few days. In others, as the violence of the inflammation of the fauces abated, erysipelas of the face appeared, involving the whole head; and in others, again, the affection was confined entirely to the fauces, and was quite obstinate. During the same period a disposition to the formation of large, very painful boils, on every part of the body, very tedious in their course and in healing, prevailed very generally."

Dr. Curwen alludes to the prejudice and misapprehension still existing in the minds of the people in regard to institutions for the insane. For the purpose of disseminating correct information, the old and injurious custom of permitting visitors in general to pass through the wards is continued. Although the inmates have frequently objected to it "as excessively distasteful and annoying," yet "it was hoped that the ultimate benefit to the community would counterbalance the temporary annoyance to the individual."

4. The report of the Western Pennsylvania Hospital contains the subjoined statistics of its department for the insane—

Patients admitted since the opening of the hospital . . .	132
Cured	65
Died	9
Remaining, December 31, 1856	39

The only information additional to that which we have already published in regard to the contemplated construction of hospital buildings upon the farm purchased for that purpose upon the banks of the Monongahela, is contained in the following extract:—

"The Board anxiously await such augmentation of their resources as, combined with the legislative appropriation of thirty thousand dollars, will justify them in commencing a building of ample size, upon the most improved construction, capable of containing two hundred and fifty patients, a plan of which, prepared under the supervision of Dr. Curwen, has been approved by Governor Pollock."

5. At the Mount Hope Institution the statistical record for the year 1856 was as follows:—

	Men.	Women.	Total.
Patients, on the 1st of January . . .	46	76	122
Admitted in course of the year . . .	64	51	115
Whole number	110	127	237
Discharged, including deaths . . .	63	51	114
Remaining, December 31	47	76	123
Of those discharged, there were cured .	34	22	56
Died	6	9	15

"The pathological condition to which death might be chiefly attributed appeared to be as follows: To extensive pulmonary disease, three; to acute mania with intense cerebral excitement, five; to exhaustive mania, two; to paralytic affections, two; to strangulated umbilical hernia, one; to perforating ulcer of stomach, one; to erysipelas of head and face, one.

"Two patients were discharged cured, after being *five* and *three and a-half* years inmates of the asylum. Recoveries like these two tend to show that hope must not be abandoned in any case, however unpromising or protracted.

"Every day's experience convinces us that insanity often exists for months without being recognized by the friends and relatives of the individual.

"Certainly, among the causes of insanity an unsubdued temper and the loss of self-control stand prominently forward. Indeed, it has been said that every one could, by an effort of the will, prevent the development of insanity. This affirmation is, perhaps, too sweeping; but, in a certain sense, it is correct.

"Parents have little conception of the nature of the evils they are engendering for their favourite children, by giving way to their caprices and fancies, and fondly gratifying all their wishes.

"Kindness with decision, regulated by justice and an earnest, heartfelt sympathy, never fails to gain the confidence of the insane patient. We should be particularly guarded never to make a promise which cannot be faithfully and fairly performed."

A large part of Dr. Stokes' report is devoted to subjects heretofore very fully discussed in our notices.

6. The report before us is the first which has emanated from the State institution of North Carolina since it was opened for the reception of patients. The Superintendent, Dr. Edward C. Fisher, seizes the occasion to pay a tribute of thanks to Miss D. L. Dix, for her "heroic and untiring efforts in originating and prosecuting with success the law establishing and building the Asylum." He remarks that the "building will be found to have been as substantially and neatly executed as is deemed desirable in an institution of the kind, its external appearance presenting a degree of symmetry and beauty rarely com-

bined in one of its extensive dimensions; while the interior possesses an air of cheerfulness and an amount of ventilation rarely met with."

The first patient was admitted on the 22d of February, 1856. It was a case of violent mania; and this person "was the first to be discharged, some months afterwards, entirely restored."

	Men.	Women.	Total.
Patients admitted from Feb. 21 to Oct. 31, 1856	59	31	90
Discharged, including deaths	7	3	10
Remaining, Oct. 31	52	28	80
Of those discharged, there were cured	3	1	4
Died	2		2

Causes of Death.—Epilepsy, 1; exhaustion, produced by abstinence from food, 1.

"During the hot weather of July and August, there occurred some thirty cases of an endemic form of dysentery, which yielded readily, however, to treatment."

We make the following extract from Dr. Fisher's exposition of the evils arising from the deception of patients in removing them from their homes to the hospitals intended for them:—

"As soon as the arrangements for the journey are made, a frank and kind statement of the proposed journey, the place in view, with the object sought, should be made. If, upon this representation, there should (as may sometimes) occur an unwillingness on the part of the patient to accompany them, and subsequent efforts to bring about a compliance with their wishes be alike unsuccessful, resort must then be had to such coercive measures as will be found necessary."

"Far better will it be to resort, if necessity compels it, to personal restraint, than to any expedient or false representation by which 'truth will be compromised,' to secure a compliance."

"A striking evidence of the evil consequences resulting from fictitious representations, is furnished by one of the inmates of the Asylum at this time, who, under the belief that by the presentation to the Governor of the State of a spurious memorial, which had been manufactured for the occasion, he would receive immense sums of money due him, and which were then in the custody of the Executive, was committed to the institution. As might be supposed, there was no difficulty in bringing him to this place; but the disappointment of the poor, deluded man, can be more easily imagined than described, when he was told the true purpose for which he had been brought. The effects upon him were also of a serious nature, causing him to refuse his food for weeks after his admission, and thereby seriously impairing his health; while he has not yet ceased upbraiding us with the charge of illegally detaining him in the house, and preventing him from obtaining his just rights."

7. The Annual Report of the Regents of the South Carolina State Lunatic Asylum has for many years included a report from the Physician, Dr. Trezevant, and another from the Superintendent, Dr. Parker. In the one now before us that of the Physician is omitted. Dr. Parker states that "on the 5th of November (1855), there were in the house 171 patients; received, during the year, 67; making 238. Of this number, 22 have been sent home as cured; 18 have died, and 11 were removed by their friends; leaving now (Nov. 5th, 1856), under care, 187; 100 males and 87 females."

"The number of male and female patients being about equal last year (85 to 86), the excess of the former at this time may be attributed to the necessity which was imposed on the Board of Regents, by the over-crowded state of the female portion of the building, to refuse the admission of females."

In the notice of a former report from this institution, we have mentioned the conflicting views of the persons connected with it in regard to a proposed enlargement of the buildings, or the erection of new ones. The Regents now

advocate the construction of two small buildings, adjacent to the existing establishment.

In our notice of the report for 1855, from the Bloomingdale Asylum, it was stated that the organization of the South Carolina Asylum had recently been changed. It now appears that the change has not yet gone into effect. We quote the language of the Regents upon the subject:—

"The present organization of our institution is certainly far from perfect; and yet the task of remodelling it is by no means so easy as some may imagine. As long as harmony prevailed among our officers, and a spirit of mutual concession was manifested, its defects were not so apparent; but, during the last two years, the difficulties arising from this source have increased to such an extent as to convince us of the necessity of some change. Deeming it wiser, in the first instance, to attempt an amendment of the existing system, rather than to adopt one entirely new, the Board has striven so to modify the regulations of the institution as to reconcile the conflicting claims of the chief officers, and thus retain the services of both. In the hope of accomplishing this end, the Board suspended the new organization in contemplation at the time of the preceding report, which would otherwise have gone into operation in February last, and again undertook to administer the affairs of the institution according to the system of rules as amended. The experiment has terminated in utter failure, and we are now fully satisfied—and purpose acting on the conviction—that harmony cannot be restored except by a radical change of organization."

The result of the experiment was neither more nor less than might have been expected. There is but one properly efficient organization for an institution for the insane, and in that the want of harmony among the officers is very easily remedied. We allude to that organization in which the Superintendent has the sole administrative control, at the same time that he is the medical officer in chief. The efforts of the Regents, as described above, were, at best, similar to those of the tinker who stops the holes of a worn-out pan. The old pan will soon leak again; the tinkered organization could not render satisfactory service, even for one brief year.

In an organization like that of the institution at Columbia, where the Superintendent is a Physician, and yet is subordinate, in the treatment of the patients, to a Visiting Physician, it is next to impossible that justice, in the public mind, should be rendered to each of these officers. It has been said of such an organization, that if there be merits, the Visiting Physician gets the credit of them; if there be demerits, defects, accidents, the responsibility falls upon the Superintendent. To a very considerable extent this is true; and we are surprised, not that difficulty has arisen between the officers of the Asylum at Columbia, but, rather, that it did not arise at a much earlier period. It is our opinion that Dr. Parker must be a pretty good Christian to have remained in the position which he occupies, as he states that he *has* remained, upwards of twenty years.

These remarks are made without the slightest knowledge, upon our part, of the actual cause or causes of the difficulty between the officers of the Asylum at Columbia, and with sentiments of high respect for both Dr. Trezevant and Dr. Parker.

8. The Report from the Indiana Hospital for the Insane informs us that that institution is "filled to overflowing;" very much obstructing what is desirable and necessary to success—a complete classification.

	Men.	Women.	Total.
Patients in the Hospital, Oct. 31, 1855 .	88	107	195
Admitted in course of the year . . .	86	85	171
Whole number " " . . .	174	192	366
Discharged, including deaths . . .	60	71	131
Remaining, Oct. 31, 1856	114	121	235
Of those discharged, there were cured .	53	56	109
Died	5	12	17

Died of pulmonary consumption, 4; chronic diarrhœa, 2; apoplexy, 3; tabes mesenterica, 2; suicide, 2; hypertrophy of heart, 1; traumatic inflammation, 1; scirrhus of stomach, 1; senile insanity, 1.

Aggregate of patients, in eight years . .	537	543	1080
Recoveries	297	297	594
Deaths			100

Dr. Athon says that he is "pretty well posted as to the number of insane in the State," and thinks that number "not far short of twelve hundred, or about one to every thousand inhabitants." "In some localities, such as the older counties on the Ohio River, and in those counties where there is a concentration of business by means of railroads, the proportion is much greater."

The Doctor thinks that tobacco has caused more insanity than spirituous liquors.

It appears that the Legislature of Indiana has adopted a resolution "inquiring the number of insane patients in the Hospital whose parents were connected by the ties of consanguinity." "Although we have no means of learning the extent of this relationship," continues Dr. A., "as applied to the whole number of patients who are and have been inmates of this Institution, there is, in our humble opinion, a sufficient number of known instances to arrest the attention of the philanthropist, and call into requisition all his arguments to prevent the intermarriage of cousins." The Doctor believes, however, that physical defects, more commonly than mental obliquities, are found in the offspring of such intermarriages.

9. The published reports of the Illinois State Hospital for the Insane are issued biennially. The one now under review is the second which has appeared since Dr. McFarland became connected with the institution.

	Men.	Women.	Total.
Patients in hospital, Dec. 1, 1854 . .			166
Admitted in the course of two years . .			302
Whole number			468
Discharged, including deaths . . .			254
Remaining, Dec. 1, 1856	94	120	214
Of those discharged, there were cured .			118
Died			23

Causes of Death.—Exhaustion, following "long-continued maniacal excitement," 8; "direct exhaustion of acute mania," 5; pulmonary consumption, 2; paralysis, 2; typhoid fever, 1; typhoid dysentery, 1; "wild parsnip," taken into the stomach, 1; suicide, 3.

From this long and thoughtfully written report, we proceed to make such extracts as appear to be the most worthy of attention and of preservation.

Form and Treatment in relation to Cause.—"Nothing can be more elusive than the attempt to predict what form of mental disease will follow the operation of any plain given cause; and when it is considered that hardly a tithe of the cases submitted to our attention are thus traceable, but that the character of the individual mind in its sane state, the effect of education, social position —all that gives or takes away the tone of the physical system, all that reaches the understanding or acts through the senses—in short, all the accidents of life combine to make up each case as we find it, we are prepared to regard every case as a unit, impossible to be considered, analyzed, or treated with any great reference to its history.

"It would be a plausible supposition, that the treatment of a given case of insanity should be adopted with reference to the cause that had called it into existence. This would be so, if the relations of cause and effect were always calculable. If the overwhelming enunciations of the theologian always sank the frenzied hearer into the insanity of hopeless despair; if the successful speculator, who had clasped fortune at a single bound, was always thrown into a state of maniacal rapture, or diseased ecstasy, we could predicate, on the one case, a cheerful and stimulating treatment, and on the other a spare regi-

men and gravity of scenery and society. Yet the actual fact is frequently the reverse of what might be expected."

Comparative Power of Causes.—"Another result of continued observation among the insane is, that special or exciting causes have less weight in the production of mental disease, in the mass of cases, than such as are predisposing or constitutional. What is frequently given, by the unskilled observer, as the cause of the disease, is merely one of its accidental manifestations."

Insanity, with Dominant Religious Ideas.—"There appears to be two reasons why the mental manifestations of the insane have so frequently a religious tinge. One is, that preceding every attack of insanity from constitutional causes there seems to be a period when most individuals have an indistinct consciousness that something unusual is about to happen. The mind dimly and fearfully apprehends the storm that is approaching. Reason, trembling with these fearful premonitions, seizes for support on that latent religious sentiment which lies in every human breast, and when the storm really bursts in its fury, this sentiment remains prominent in all the ruin that follows. Another reason seems to be that the insane mind has a natural affinity for the unseen and the mysterious."

Puerperal Insanity.—"The peculiar pathological condition of the system known among medical men as 'the puerperal state,' has been an extremely prolific cause of insanity during the period which this report covers. This may be partly an accident of the time, though we are satisfied that insanity from causes incident to the child-bearing state, is more frequent in the circle from which patients in this institution are derived, than in those contiguous to most other hospitals whose reports reach us. Marriages entered into before the physical system has reached its full maturity; the great dearth of means of sufficient intelligence to render proper assistance at such a critical period; the discomforts attending a sparse population; and the other deprivations of frontier life, are sufficient to account for the prominence of this among the causes enumerated in our table."

Regimen and Medication.—"The general and local depletions, the counter-irritants, the spare diet, and the routine once prescribed under the general phrase of 'the antiphlogistic regimen,' have long since yielded to a method diametrically opposite. Even cases which bear on their surface the tokens of sthenic action are now met, with constant success, by a liberal diet and properly graduated stimulants. We allude to this, because we yet occasionally receive patients who have, to quote a descriptive letter recently received with one of them, 'been well bled and blistered, *but without apparent effect.*'"

True Use of Insane Hospitals.—"An insane hospital bears the same relation to the diseased mind that the splint and bandage do to the fractured limb. It protects it from dangerous extraneous influences, and holds it in a position to admit of the requisite medication. As there are some fractures where neither of these demands exists, so there are many cases of insanity where nature and art may effect the cure without unusual interposition. To an insane person whose domestic attachments remain firm, and whose delusions in no way impair the moral affinity which should exist to those about him, removal to the care and society of strangers is a measure of, at best, questionable expediency."

Caution against too early removal of persons to the Hospitals.—"Cases of insanity occurring without known cause, in a neighbourhood and at a time when fever is epidemic, should be examined with great caution before a tedious journey to the hospital is resolved on, as that strain on the vital resources is almost invariably made when the system demands strict quiet in order to pass the coming crisis of the disease. Especially should such a transference be avoided when the pulse has become disturbed, the mouth and teeth incrusted with sordes, and other symptoms of the typhoid state have begun to show themselves. A journey under such circumstances is little short of manslaughter."

In all recent cases, "in young persons particularly, some weeks should elapse before the extreme step (removal to a hospital) is taken. This we urge, still keeping prominent the fact that insanity is of difficult cure much in proportion to the length of its continuance."

Causes which are less potent in Europe than in America.—A somewhat pro-

tracted discussion upon that numerous class of cases in which the insanity is the offspring of masturbation, is closed by the following remarks:—

"When the writer of this report attempted to find this class of cases in the insane hospitals of continental Europe, to his surprise they were almost wholly wanting; and, although abounding to a greater extent in those of Great Britain, they were derived from what are there termed 'the lower classes.' The careless *abandon* with which the population of the former yield themselves to the full enjoyment of the almost innumerable festivals, gives us the key to their general exemption from those detestable vices which develop themselves where such enjoyments are proscribed. An observer can find tolerance for the Sabbath-crowd of a German beer-garden, in the counter-observation that it keeps down the population of the lunatic asylum. The race-course, the regatta, the cricket-ground, and the boxing-club, banish such vices in a great measure from the wealthier and more educated classes of British society, and confine them to the sedentary artisan, forced to celibacy by his poverty, and denied the costly amusements of his richer and more aristocratic neighbour. The careful persistency with which manly sport and exercise is made to blend with English university life, did not escape the quick observation of our countryman, Irving, whose baronet, having heard that his son at college had dismissed his tutor and taken a horse, uttered no reprimand, but doubled his allowance, that he might afford both.

"So long as we have no national amusements whatever; so long as mirth and sport are considered exclusively as puerilities; so long as the college is without its gymnasium and its traditional sports, and the school-house has no well-trodden play-ground; so long as man is an iron-bound and close-rivetted dollar-grinding automaton, which bends every moment at some false shrine of morality or repectability; just so long will the wards of American institutions for the insane be thronged with such subjects as we have described. If society will constantly wear its Sunday dress of enforced constraint, it must pay for the privilege in such coin as violated nature chooses to exact."

10. The reports of the Officers of the Missouri State Lunatic Asylum are biennial. The one now under notice contains the subjoined statistics:—

	Men.	Women.	Total.
Patients in the Asylum, Nov. 27, 1854 .	53	41	94
Admitted in the course of two years .	63	48	111
Whole number	116	89	205
Discharged	45	25	70
Remaining, Nov. 24, 1856 . . .	71	64	135
Of those discharged, there were cured .	25	16	41
Died	11	7	18

Causes of Death.—Consumption, 5; ulceration of the bowels, 4; acute mania, 3; chronic mania, 2; epilepsy, 1; strangulated hernia, 1; pneumonia, 1; suicide, 1.

Dr. Smith makes the following remarks upon the registration of deaths:—

"It would seem, in registering the causes of death in hospitals for the insane, the chief design should be to indicate the mortality of insanity; but in examining the tables of different institutions, we would infer the leading object to be to show the fatality of other forms of disease, and that very few ever die of this grave malady. Could any one, with all our reports before him, draw a correct conclusion in regard to the mortality of insanity, or the comparative mortality of the different forms of the disease? It strikes me that, in determining these points, our observations have not been as accurate and discriminating as they might have been, and as doubtless true, that diseases have not unfrequently been registered as the causes of death which were clearly the effects of insanity. It is well known, for example, that in cases of chronic mania diarrhœa usually precedes death; indeed, this is so common that it may with as much propriety be regarded as one of its symptoms, as it is of the last stage of phthisis; and yet, almost without exception, this is registered as the cause of death. In all institutions whose reports indicate the causes of death,

diarrhœa is given as one of the most prolific, and thus, chronic insanity, in most instances perhaps the true cause, is left entirely out of view, and the impression is made that it is rarely attended with fatality."

The subject thus treated by Dr. Smith has undoubtedly arrested the attention of most physicians engaged in the treatment of the insane. Years ago we gave to it no inconsiderable study and reflection. It is one of those subjects which are encompassed with difficulties of such a nature that, in the present state of pathology, the attempt to arrive at scientific truth appears to be futile. The remarks of Dr. Smith give no clue to any method by which the difficulty is to be overcome. Indeed he has, himself, like many others before him, made the mistake of treating *as a pathological condition* that which is merely *the symptom of a pathological condition*, or rather, in the present state of our knowledge, *the symptom of various pathological conditions*. If there be a "mortality of insanity," there is, by parity of facts and by parity of logic, a mortality of delirium. Supposing, then, that it be recorded in a given case, that the patient "died of delirium." Of what value in science is the record? None. What definite idea is imparted by it? Simply that the *symptom* of delirium attended the disease of which the patient died. It is impossible for the reader to tell whether he died of typhoid fever, or of erysipelas of the head, or of some disease which caused acute mania, or of meningitis, or by starvation, or by exposure to cold, or from the effects of opium, haschish, or some other narcotic, or from some other of those causes of mortality which are accompanied by delirium. So if, in the report from an institution for the insane, it be recorded that a patient *died of acute mania*, the reader is left in entire uncertainty of the real pathological lesion which terminated life. It might have been meningitis; it might have been cerebritis; it might have been cerebral anæmia, or the condition producing dyspepsia, or some organic affection of the heart, or the liver, or some one or more of various other conditions. If it be reported that another patient *died of chronic insanity*, the reader is no less puzzled; no less bewildered; no less confounded. He gains from it no knowledge which is of any value to him.

From the foregoing considerations, it will be perceived that we cannot agree with Dr. Smith, when he says "Diseases have not unfrequently been registered as the causes of death which were clearly the effects of insanity." Make the sentence read "*clearly the effects of that lesion, or of one of those lesions one symptom of which is insanity*," and it would fully coincide with our views of the subject. The following remark, however, is in accordance with our opinion: "It is impossible for any mind, however acute and penetrating, to determine the influence of a morbid state of the brain upon the fatality of the numerous maladies to which the insane are subject."

The subjoined extract places in its true light the subject upon which it treats:—

"While the law of love is the great distinguishing feature of hospitals for the insane, I do not wish to be understood as stating that an instance of unkind treatment never happens. Examples of this kind will occasionally occur, with the strictest supervision, as long as imperfections attach to human nature. I do, however, with confidence state that in a well conducted asylum for the insane, where a regular system of management pervades the whole building, and all are alike and daily impressed with the importance of uniform kindness and self-control, in the midst of provocation of every description, such occurrences are of far less frequency than they would be if the same patients were in private families, and under the immediate control of their nearest friends and relations."

11. The report for 1855, of Dr. Reid, the Superintendent of the State Insane Asylum at Stockton, California, is ornamented with an engraved view of that institution. The building is of the castellated Gothic order, and, if it looks as well as its miniature representation, is a handsome edifice.

"The institution possesses an eligible and healthy situation, plain and substantial buildings; large, airy, and well ventilated rooms; cold, warm, and shower baths; ample space for recreation; and grounds for labour, with plenty of trees, shade, and pure air.

"There is not a single cell in or about the establishment; and only ten rooms with double doors, and strong wooden gratings in the windows.

"The reading-room contains a library of two hundred choice volumes, seven daily newspapers, eight weeklies, and one monthly.

"The cabinet contains above one hundred species of birds, fifteen species of animals, and a fine collection of reptiles, shells, and minerals. They are nearly all of California origin.

"The block of land on which the main buildings are situated, has been laid out and planted with a great variety of indigenous and exotic trees and shrubs. The office, apothecary, and reception rooms have been furnished neatly and elegantly, and all the wards, halls, and rooms supplied with comfortable and substantial furniture. In fact, the institution is now in an elegant condition, and will compare favorably with those of a similar character in the Atlantic States."

	Men.	Women.	Total.
Patients in the Asylum, Jan. 1, 1855	120	14	134
Admitted in course of the year	184	30	214
Whole number	304	44	348
Discharged, recovered	148	20	168
Died	16	2	18
Remaining, Dec. 31, 1855	140	22	162

The report contains a brief history of the progress of insanity in California, and the measures adopted for its treatment. We give a synopsis of the most valuable portions of it.

In the course of the year 1850, about twenty-two cases of insanity were known in San Francisco, some of them, as we infer from the report, having been brought in from the surrounding country. They were treated at the Marine Hospital, or temporarily confined on board a vessel in the harbour. In 1851, thirty-four cases were received at the State Hospital in Sacramento, and 13 at the General Hospital in Stockton. "In 1852, by an Act of the Legislature, all insane persons throughout the State were directed to be sent to the State Hospital, in Stockton, for treatment. In this year 124 were admitted." "In 1853, the General Hospital system was abolished, the County Hospital system substituted, and the Insane Asylum created." That which was the General Hospital, at Stockton, was now converted into an institution for the insane. In the course of the year, 160 new cases were admitted. In 1854, there were 202 admissions; and in 1855, 214.

	Men.	Women.	Total.
Whole number of patients, 1851 to 1855, inclusive	640	73	713
Discharged recovered	436	45	481
Died	56	6	62

Causes of Death.—Dysentery, 17; epilepsy, 9; mania-à-potu, 7; typhoid fever, 7; marasmus, 6; acute mania, 5; phthisis, 4; puerperal fever, 3; paralysis 3; ascites, 3; meningitis, 2; erysipelas, 2; laryngitis, 1.

"During the four cold, wet months, more deaths occur than during the entire dry season of eight months. In the past year, of 18 deaths, 12 occurred during the rainy season. Of 62 deaths in five years, 40 happened in the rainy, and 22 in the dry season."

Regimen and Treatment.—"Simple but substantial food is generally best for the insane. No greater error can be committed than placing them on a low and insufficient diet, or administering active purgatives, or abstracting large quantities of blood. The insane have rarely too much blood, but it is unequally distributed. The brain is irritable, but not inflamed. This condition demands quieting remedies and nourishment, not bleeding and starvation. Narcotics will quiet and control, depletions aggravate and destroy."

Work by Patients.—"Nearly all the clothing for the men, every article of wearing apparel for the women, all the mattresses, sheets, pillow-cases, and spreads, used in the institution have been manufactured by the inmates."

Popular Psychologic Condition.—"In proportion to the population the number of insane persons in the State is very large; and the number now in the asylum shows how rapidly the disease has increased among a people whose distinct existence bears only the age of six years.

"It is reasonable to suppose that it will progress more slowly hereafter. Many causes have been greatly modified; some have nearly ceased. The people have become more settled and permanent, more moral, more temperate, more contented, happy, and free from excitement.

"A peculiar mania with a propensity to self-destruction has existed endemically throughout this State during the past two years."

Suggested House of Correction for Inebriates.—"An institution of this character, carefully established and under proper management, would prove of incalculable value to the morals, the habits, and the industry of the people; it would be productive of wealth, prosperity, and happiness to thousands of families in the land, and a source of revenue and profit to the State. It would produce more beneficial effects, result in more immediate good and permanent benefit to the people and the State, than all the Maine liquor laws and statutes of temperance that were ever enacted."

Meteorological observations for 1855 at the asylum. Latitude 37° 57′ N.; longitude 121° 14′ 26″ W.

	Temperature.								
	Mean.			Maximum.			Minimum.		
	8 A.M.	2 P.M.	8 P.M.	8 A.M.	2 P.M.	8 P.M.	8 A.M.	2 P.M.	8 P.M.
January	44°	54°	47°	52°	68°	54°	36°	44°	42°
February	49	62	54	58	70	58	40	54	46
March	56	65	59	62	72	68	44	54	48
April	58	66	58	64	80	70	48	56	52
May	59	69	61	74	90	82	52	60	52
June	69	83	73	80	95	85	62	72	64
July	70	81	75	80	98	84	62	76	60
August	70	88	74	78	98	82	64	75	64
September	62	80	68	68	88	78	56	72	60
October	64	82	70	72	92	78	52	70	57
November	48	57	52	54	72	60	38	52	48
December	43	53	48	50	62	64	28	40	38

January—Rain, 2.9 inches; cloudy days, 14; clear days, 17. *February*—Rain, 2.74 inches; cloudy days, 7; clear days, 21. *March*—Rain, 2.2 inches; clear days, 22; cloudy, 9. *April*—Rain, 3.29 inches; clear days, 20; cloudy, 10; on the 11th, heavy hail. *May*—Rain, 1.1 inches; clear days, 25; cloudy, 6; on the 14th, thunder, lightning, and hail. *June*—Rain, 1 day; 29 days perfectly clear. *July*—Rain, none; every day clear. *August*—No rain nor clouds; 31 clear days; wind invariably N. W. *September*—No rain; every day clear; wind N. W. invariably. *October*—No rain; every day clear; wind N. W. *November*—Rain and dew, .74 of an inch; clear days, 20; cloudy, 10. *December*—Rain 2.42 inches; cloudy days, 14; clear, 17. P. E.

Art. XV.—*On Dysentery and its Treatment.* By Henry Tiedemann, M. D., Member of the College of Physicians, and of the Academy of Natural Sciences at Philadelphia. 12mo. pp. 29. Philadelphia, 1857.

In the publication of this essay the leading object of the author, as set forth in the preface, is to make known to the profession his method of treating dysentery, with the view of bringing it into more general use.

In furtherance of this object, Dr. Tiedemann introduces his therapeutical

directions, with some very interesting general remarks on the pathology of dysentery.

He maintains that the inflammation of the lower portion of the intestinal canal, in which it is now almost universally admitted that the disease essentially consists, commences invariably by a hyperæmic, inflamed, and infiltrated condition of the submucous intestinal tissue, the inflammation of the proper mucous membrane, when it occurs, being the result, always, of an extension to it of the disease previously existing in the subjacent areolar structure. To this latter he refers the tenesmus, and frequent discharges of a purely mucous character which constitute the prominent and almost characteristic phenomena of dysentery, especially in its early stage. As soon as the discharges become mixed or stained with blood, it is an indication, he remarks, that the inflammation is no longer confined to the submucous, but has extended to the mucous tissue itself.

Although Dr. T. is probably correct in locating the hyperæmia and inflammation, in the early stage of most cases of simple dysentery, in the submucous areolar structure, yet, as in many endemics the discharges from the very onset of the attack consist either almost exclusively of blood, or of mucus more or less mixed with blood, it is evident that from the first the mucous, as well as the submucous tissue, may be simultaneously inflamed.

The hyperæmia of the capillary system of the rectum, constituting the first stage of dysentery, Dr. T. refers to a repletion of the large veins of the liver, and consequent disturbance of the circulation through them.

"The interruption of the venous circulation in the liver, with otherwise healthy individuals, during summer, "is caused," he remarks, "by increased venosity. In this season all the tissues of the body, and, in some measure, all the organs expand, consequently also the liver. This expansion of the liver is not only owing to the higher temperature, but also to the slower circulation of the blood in its overcharged veins. The disturbed circulation of the veins of the liver must necessarily cause a disturbance of circulation in all the veins of the abdomen, which will extend to the capillary vessels, and under circumstances favourable to the disease, may generate the hyperæmia as a precursor of dysentery."

The principal exciting cause of dysentery, according to Dr. T., is cold, with its influence upon the tissues and organs.

"The influence," he remarks, "of sudden cold upon the liver must be the contraction of its tissues; the effect of this contraction, very often, is only the frequent *status biliosus*, an overflowing of bile into the duodenum and the stomach; in a measure the bile, by the contraction of the liver, is pressed out of the tissues of the liver. This stat. bilios., a frequent attendant on dysentery, indicates the propriety of administering emetics, which are not applicable in all cases of dysentery. But the contraction of the liver and of its vessels also affects the circulation of the blood in the abdominal veins, even to the capillaries, and must produce the most injurious effect in that part of the intestines which is most remote from the liver. This part is the rectum, in which, on account of its almost perpendicular position in the cavity of the pelvis, the return of the blood is more difficult, and favours the development of hyperæmia to a still greater extent. This hyperæmia first produces a narrowing of the intestinal canal, and consequently the sensation of pressure and fulness, as if the rectum were overcharged with feces. This erroneous impression, by reflex action, causes an increased urging to stool. Next, the submucous tissue becomes infiltrated and tumid, and the mucous membrane is excited to an increased secretion. This infiltration presses the mucous membrane of the duct closely together, the passage is entirely closed, and *tenesmus, the first characteristic symptom of dysentery*, is the result. A general febrile reaction, gastricism, and other minor or more important symptoms ensue.

"The further extension of dysentery from the rectum into the higher parts of the intestinal canal, depends upon the mechanical progress of the hyperæmia into the capillaries, and the infiltration into the submucous tissue, and is explained by the arrangement of the veins in the duplicatures of the peritoneum.

"During the further course of dysentery, the mucous membrane must ne-

cessarily become involved in the morbid process; the deep transverse folds of the mucous membrane, embedded in the submucous tissue, are always first affected." "As long as the mucous membrane is not involved in the disease we find the peculiar dysenteric evacuations which form the *second characteristic symptom of dysentery*. When the mucous membrane becomes involved in the process of the disease, it soon shows its morbid action by the admixture of blood, generally of a light colour.

"The further course of the disease is in proportion to the progress of the inflammation of the submucous tissue and the mucous membrane, the formation of ulcers with undermining passages in the submucous tissue, croup-like secretions, &c. Pus and ichor are poured out, and not unfrequently typhoid phenomena appear as an effect of the resorption of these secretions, but not as constituting a separate species of dysentery."

In its general outlines the pathology of dysentery as laid down by Dr. T. is perhaps correct. We must protest, however, against the purely mechanical explanation which he has given of the manner in which the lesions of function and structure are induced by the operation of the action of the predisposing and exciting causes of the disease.

That after long-continued exposure to intense heat, especially when combined with an impure state of atmosphere, the sudden exposure to even a moderately cold temperature, is capable of giving rise to hyperæmia of the lower portion of the intestinal mucous membrane, and a consequent disturbance of the normal functions of those parts, so as to endanger the occurrence of profuse diarrhœa, or even of cholera morbus, is unquestionably true; under particular circumstances the hyperæmia may also pass over into inflammation and give rise to dysentery, is likewise granted; but we cannot conceive of these series of morbid phenomena being brought about by a dilatation of vessels or organs from the effects of heat, succeeded by a contraction, from subsequent exposure to cold of the same organs.

Dr. Tiedemann denies that dysentery is a malarious disease, or has any affinity to intermitting fever, though it will often be found to prevail in the same localities with the latter. "It generally makes its appearance," he remarks, "when, after a long continuance of hot and dry weather, the atmosphere becomes suddenly wet and cold. It is an endemic in such portions of the tropics as have, from the influence of the sea-breezes, the nights much cooler than the day." All this is certainly correct; dysentery, nevertheless, is known occasionally to prevail as an unquestionable epidemic, and in sections of country in which it is otherwise seldom met with; it is, therefore, very evident that there are certain unappreciable morbific conditions of the atmosphere capable of giving rise to it, independent of a mere change in its temperature and hygrometric condition, although to these latter its production is referable in the majority of instances.

"I know only of two symptoms which are characteristic of dysentery, and which always suffice to recognize the disease. *The first is tenesmus, the second the evacuations.* These symptoms must occur together to establish a case of dysentery. Tenesmus, without the characteristic evacuations, constitutes no more dysentery than the characteristic evacuations without tenesmus would entitle the disease to be called dysentery. In the different stages of the disease the tenesmus also assumes a different character; thus—

"*In the first stage*, it is seldom intermittent, not even in the mild cases; it is only more bearable. In the more violent, as well extensive as intensive cases, the tenesmus is exciting in the highest degree, and truly torturing, and the discharge of inodorous mucus, mixed with white spheroid granules, with or without blood, gives no relief. As soon as the tenesmus becomes distinctly intermittent, the disease is either on the decline, or it has entered on the

"*Second stage.* The tenesmus is now accompanied by a high state of anxiety, not by excitement, as in the first stage. Every evacuation is followed by great exhaustion and violent burning in the rectum, from the anus upwards, whilst tenesmus comes and goes with distinct intermissions.

"*In the third stage* the intermissions are of longer duration; the tenesmus is

preceded by greater anxiety, and the evacuations by prostration, even to fainting. The burning sensation in the anus and rectum diminishes.

"These three stages do not always appear in this pure and decided form, as the three stages are sometimes or generally found in different parts of the intestines.

"The symptoms of tenesmus are explained by the anatomical results of the three stages.

"*In the 1st stage* inflammation and a spongy condition of the submucous tissue. *Discharge:* mucus, with or without blood, and occasionally with balls of scybalæ.

"*In the 2d stage*, decided sympathy of the mucous membrane and commencement of ulceration. *Discharge:* shreds of the lining membrane of the intestines; brownish mucus, more liquid, and coloured with blood, rarely mixed with pure blood.

"*In the 3d stage*, extension and deep ulceration of the mucous membrane and undermining ulceration of the submucous tissue. *Discharge:* blood mixed with pus, shreds of necrotic cellular tissue, and ichor.

"The evacuations, however, do not always correspond with that described in each of the three stages; and not unfrequently we find, in one evacuation, the discharges belonging to two or three stages at the same time; as all the stages can exist at once in different portions of the diseased intestines.

"Tenesmus is caused by the infiltration of the submucous tissue, which, by its swelling, mechanically narrows the passage of the intestines. In the beginning of the disease this swelling causes irritation and contraction of the muscular tissue, whereby the intestinal tube is still further narrowed, so that, in the progress of the disease, paralysis of the muscular tissue of the intestines, principally of the rectum, may supervene. The infiltration of the submucous tissue, which appears in mammillated (hump-like) protuberances on the mucous membrane, mostly in the direction of the transverse folds, causes the parietes of the intestinal tube to swell in such a manner against one another that they come into the closest contact, and that the passage is completely shut up. This closely compressed mucous membrane causes great urgency to evacuate, as if the rectum were filled with feces, which by contraction, a real reflex motion, it were striving to remove. The consequence of these efforts are tenesmus and the peculiar dysenteric evacuations."

Dr. T., in his account of the production of tenesmus, seems to have entirely lost sight of the increased irritability of the mucous tissue of the inflamed intestine, which would appear to us to have as much to do with the production of these as the cause pointed out above.

"The prolapsus of the mucous membrane of the rectum," Dr. T. observes, "or of a part of the entire rectum, is said to be occasioned by violent contractions of the muscular tissue of the rectum, also by too violent contraction of the sphincter. The contraction of the muscular tissue can only produce prolapsus, when there is, at the same time, relaxation of the sphincter, the violent contraction of these muscles must, of course, prevent prolapsus. Prolapsus recti, however, seldom occurs in the commencement of this disease, and only when the patient is weakly, and the inflammatory irritation of the muscular tissue of the intestines passes rapidly over into paralysis, which is communicated to the sphincter. In very violent or badly treated cases, with persons who are not otherwise weakly, an early paralysis of the muscular tissue of the intestines, and of the sphincter, may cause prolapsus recti, a symptom which always indicates danger. Generally, however, the prolapsus appears in a more advanced stage of the disease, when the inflammation cannot be abated, or when it changes to paralysis by the partial destruction of the muscular tissue and extends to the sphincter. This prolapsus does not unfrequently occur before death. In all cases of violent dysentery I found, on examination of the anus, which, at the beginning of the disease had been firmly closed and red, the same more or less opened, so that the tumid and highly reddened mucous membrane of the rectum could be seen. At the same time, the most violent tenesmus continued. This shows, conclusively, that the prolapsus recti is not caused by the spasmodic contraction of the sphincter."

Having thus presented his views in relation to the pathology of dysentery, Dr. T. gives a general outline of the plan of treatment pursued by him, and by the employment of which, during the last six years, he has succeeded in curing upwards of three hundred cases of dysentery, not a single death from the disease occurring in his practice during that period.

"As dysentery," he remarks, "in the first two stages, is a hyperæmia of the capillaries of the rectum and colon, and seldom of other parts of the intestinal tube, induced by the disturbed hepatic venous circulation, followed by infiltration and inflammation of the submucous tissue, which in the further progress is communicated to the mucous membrane and changes to ulceration, it distinctly indicates in these two first stages a general and local antiphlogistic treatment.

"The *internal* remedy which I have almost exclusively prescribed, and frequently with surprising success, is *nitrate of potassium* (*kal. nitr.*). I have given it in large doses, which agreed perfectly well with the patients. *Locally*, I have ordered, immediately after each evacuation, no matter how often they occurred, *injections of pure cold water*. (In very severe cases, particularly in hot weather, he has ordered injections of ice water with the best effects.) As diet, I ordered milk, gruel, barley, rice-water, toast and water, pure water, and buttermilk as much as the patient liked to take.

"The nitrate of potassium and the injections, I continued until the tenesmus had ceased, which, in the majority of cases, happened in from six to twelve hours. As the tenesmus diminished, the mucous and bloody evacuations also diminished, and when it ceased, they generally disappeared entirely.

"Before I order the nitre, I consider the state of the digestive organs; which either require an emetic or purgative, or are in such a condition that nitre can be immediately given. If during the treatment with nitre and injections of cold water, evacuations of fecal matter do not occur, at least once in twelve hours, which usually is the case, I recommend a corresponding dose of castor oil."

Under all circumstances, and in every case of dysentery, whether sporadic, endemic, or epidemic, whatever may be the age, sex, or constitution of the patient, Dr. T. has found the above treatment applicable.

When the dysenteric symptoms, with all symptoms of fever, are subdued; the evacuations having become natural, which he has often found to occur within twelve hours, Dr. T. gives a solution of sulphate of quinine, and, on the third day frequently allows a better diet; after each evacuation he directs an injection of cold water for a few days longer. If regular evacuations do not occur he orders occasional doses of castor oil.

In the first two stages of dysentery, Dr. T. denounces all other remedies as useless, if not mischievous. In only two severe cases occurring in sensitive females, was he obliged to administer narcotics. When the skin is inactive he gives the nitre dissolved in an infusion of ipecacuanha, with the addition sometimes of camphor-water.

"Under this treatment," Dr. T. remarks, "when I was called in time, the disease seldom reached the second stage, never the third; the patient recovered very fast, probably because the disease was not of long duration. I have had but few cases where it lasted longer than seven days; only one lady was ill to the fourteenth day, although the dysenteric symptoms had ceased on the seventh day; she was pregnant on the second month, but did not miscarry. Most cases had already changed so favourably on the third day, all the dysenteric symptoms having ceased, that no more medicine was required, and I could leave the patient, merely ordering a proper diet for a short time to come."

When the disease has been allowed to run on to the third stage, with a continuance of the injections of cold water, Dr. T. directs quinine, tannin, acetate of lead, &c., generally with opium, accordingly as the case seemed to require the one or the other remedy; with daily doses of castor oil, to promote the necessary evacuations, and, in time, a nourishing diet.

Of the treatment of dysentery, in its early stages, exclusively by nitre and injections of cold water we have no experience. The professional standing of Dr. T. is such, however, as to press it strongly upon our attention. We have

prescribed the nitre, occasionally, in conjunction with opium and ipecacuanha, and we are persuaded with the best effects. We cannot agree with Dr. T. in his denunciation of opium as positively mischievous in the early stages of dysentery. We are in the constant habit of giving it from the very onset of the disease, and always with the very best effect. To derive from it the good it is calculated to produce in this disease, it must, however, be given in large doses. The effect of small and frequently repeated doses is rather mischievous than beneficial. Although we have generally found sporadic dysentery a troublesome and obstinate rather than a fatal disease, we have certainly not been quite so successful in its treatment as Dr. T. In a few cases, occurring in very young, or in diseased and broken down constitutions, the disease has terminated fatally. We very much doubt whether in these cases the termination would have been different had we subjected them to the treatment laid down in the essay before us.

D. F. C.

Art. XVI.—*Clinical Lectures on Certain Diseases of the Urinary Organs, and on Dropsies.* By Robert Bentley Todd, M. D., F. R. S., Physician to King's College Hospital. 8vo. pp. 283. Philadelphia: Blanchard & Lea, 1857.

The plan of this volume is similar to that of the recent work by the same author, on *Diseases Affecting the Nervous System.* The favourable reception given to the latter has led to the publication of these lectures. So the author says in his preface; and we are glad to see this statement, not merely from a disposition to congratulate him on the satisfaction which he must derive from the evidence that his labours are approved by his professional brethren, but because the fact denotes a disposition, on the part of the medical public, to receive with favour works of a practical character, like those for which we are indebted to Dr. Todd. Believing, as we do, that the advancement of practical medicine is to be promoted mainly by clinical researches, aided by the light derived from the investigations of the anatomist, the physiologist, and the chemist, we regard the avidity with which such works are sought after as indicating a prevailing tone and spirit productive of present benefit, and promising much for the future. Medical instruction of late years has been characterized by the prominence given to bedside teaching; in other words, medicine, as a branch of instruction, like other branches of scientific knowledge, is considered as demanding illustration and demonstration, which, of course, can only be afforded by placing before the eyes of students patients exemplifying the phenomena of disease. So in medical literature, the works considered most useful to the practitioner are those which embody the facts obtained by clinical observation or the results deduced therefrom.

But clinical teaching, oral or bibliographical, is not so simple and easy a matter as some imagine. The mere rehearsal or description of the obvious phenomena of disease is barren and tedious. Dry reports of cases, if read at all, are read with little profit, and a considerable portion of the periodical medical literature of the present time is of this description. To excite interest and furnish instruction, the historical facts of disease are to be employed as exemplifying truths underlying the mere external phenomena—truths having direct and important bearings on diagnosis, pathology, and therapeutics. In a word, what the medical student and practitioner desire to know is, not alone that which is to be observed in the progress of diseases, but the significance of that which observation discloses.

Returning to the volume which has suggested these remarks, we have a series of sixteen clinical lectures on certain diseases of the urinary organs, and on dropsies. The object of the author is to present the most important of the practical points pertaining to our present knowledge of these diseases, as illustrated by cases selected from those occurring under his observation at King's College Hospital. The histories of the cases are given with sufficient detail for illustration, avoiding tedious and useless minuteness. They are selected

judiciously with reference to their pertinency in exemplifying points of diagnosis, pathology, and therapeutics. The two first lectures are devoted to hæmaturia; lectures third and fourth, to the various forms of disease of the kidneys associated with albuminous urine and dropsy. Dropsy dependent on renal disease is treated in lectures fifth, sixth, seventh, and eighth. Lectures ninth and tenth are appropriated to cardiac dropsy. Ascites is the subject of the eleventh lecture. Morbid conditions of the kidney, attributed by the author to gout, form the subject of the twelfth lecture. Purulent urine and its relations are treated of in lecture thirteenth. In the remaining three lectures, gout is considered in its various pathological relations.

The reader will perceive from the foregoing enumeration that the topics discussed in these lectures cover considerable ground. The scope of the work, in fact, would hardly be inferred from the title. The propriety of including gout (to which not a small space is allotted) among diseases of the kidney, is open to criticism; but it must be admitted that it would be difficult to fix upon a nosological place more appropriate. Were we to write a review of the work, we should find an occasion for criticism in the pathological relations assumed to exist between affections of the kidney and bladder and the gouty diathesis. The tendency to refer a great variety of local affections to this diathesis, on grounds which will not bear critical analysis, is not peculiar to the author, but is a habit with British writers. One reason for this doubtless is, that gout is much more prevalent in Great Britain than in this country, or on the continent of Europe.

On the whole, a careful perusal of this work has afforded us pleasure and profit. The subjects are among the most interesting and important of those pertaining to practical medicine. The author's views are consistent with the developments resulting from the investigations of late years, directed toward the diseases of the kidneys and their pathological relations. The manner in which the subjects are treated is well adapted to meet the wishes of most practitioners in obtaining a practical work. The points are clearly and concisely presented in a simple colloquial style of composition. We commend the volume most cordially to our medical brethren. A. F.

ART. XVII.—*On the Diseases of Women, including those of Pregnancy and Childbed.* By FLEETWOOD CHURCHILL, M. D., T. C. D., M. R. I. A., etc. etc. A new American edition, revised by the Author. With notes and additions by D. FRANCIS CONDIE, M. D., etc. etc. 8vo. pp. 768. Philadelphia: Blanchard & Lea, 1857.

THE treatise of Dr. Churchill on the Diseases of Women, which has already passed through numerous editions, is too well known to the profession at large to require that we should, at the present time, enter into a formal examination of the manner in which the author has accomplished the task undertaken by him in the preparation of the work—to present, namely, a faithful guide to the advanced student and young practitioner in the investigation of the pathology and therapeutics of the maladies incident to woman, during the non-pregnant condition, as well as during gestation, and the puerperal state.

His description of the several diseases included within the scope of the treatise, are recognized as clear, accurate, and satisfactory, and his pathological views as in accordance with the observations of the latest and most reliable authorities, while his practical directions, based upon the experience of those skilful in the treatment of female diseases, compared and tested by the results of his own ample practice, are sound and judicious—neither marked by undue timidity on the one hand, or that indiscriminate rashness which has, too often, been mistaken for masterly boldness, on the other.

In the edition before us, the work has undergone a thorough revision at the hands of the author; a considerable portion of it has been rewritten, and much

new matter has been added throughout. It comprises, unquestionably, one of the most exact and comprehensive expositions of the present state of medical knowledge in respect to the diseases of women, that has yet been published.

The practitioner may consult it, in full confidence of meeting with a notice of every valuable contribution towards the elucidation of the nature, character, and treatment of those affections, furnished by the masters in the profession who have, of late years, studied them with the closest attention, and under the most favourable circumstances.

What renders the treatise of Dr. Churchill a safe work of reference for the young practitioner, is the entire freedom from dogmatism evinced by the author, or any attempt to bend acknowledged facts in support of his own opinions, in respect to either the pathological character or therapeutical management of particular diseases, or to ignore entirely those of too unpliant a nature to be thus disposed of. In more than one instance, we find that Dr. Churchill has been induced to modify materially the views previously advanced by him, in conformity with the teachings of more recent, extended, and accurate observations.

On a reference to the chapter on puerperal fever, it will be perceived that the author has considered it necessary to change in some measure his views in regard to the pathology of that important and heretofore greatly misunderstood disease since the appearance of his former edition.

While he still adheres to the somewhat awkward and artificial division of the fever into distinct species, according as local inflammation predominates in the peritoneum, in the womb, and in its appendages, or in the uterine veins or lymphatics, he nevertheless very freely admits that this division is far from being accurate, inasmuch as cases are seldom met with in which puerperal fever can be, in fact, described as simple peritonitis, metritis, phlebitis, etc.; several or all of these lesions being most usually combined in the same case. Hence he does not present the several varieties of puerperal fever described by him as "essentially and widely distinct, as to symptoms, causes, and course, in every epidemic."

In addition to those forms of the disease delineated by him in former editions, he adds another, the gastro-enteric, a form under which puerperal fever unquestionably presents itself occasionally, and which, in its course and termination, is far less severe and fatal than that under which it usually occurs. The very excellent description given of it by Dr. C. will prove highly interesting to the practitioner, inasmuch as gastro-enteric or strictly typhoid puerperal fever has been known to prevail epidemically more frequently than it does as an endemic.

To the malignant form of puerperal fever a much greater degree of prominence is given in the present than in former editions, and very properly, it being confessedly the one that has been most usually observed during the more recent epidemical visitations of the disease.

While Dr. C. admits that cases of simple peritonitis, metritis, or phlebitis, etc., may and do occasionally occur during the puerperal state, he nevertheless very "honestly and candidly" confesses that a more extended experience has led him "to believe that malignant puerperal fever is something more than a local affection, and that the constitutional disease is often rather primary than secondary."

"If any one," he remarks, "will carefully compare a case of simple inflammation of the womb or peritoneum in childbed with a case of malignant epidemic puerperal fever, their symptoms, general and local characteristics, course, and the effects of remedies, they will be obliged to come to the conclusion that, although the latter may exhibit local disease, it is not exclusively nor primarily a local affection.

"I should wish to speak very cautiously and guardedly on so difficult a subject, but, after a careful comparison of the experience of others with my own, I am inclined to believe that the essential difference between epidemic puerperal fever and simple inflammation consists in a morbid deterioration of the blood in the first case, which is rarely present in the latter, or not until an advanced

stage, whether this deprivation results from some noxious influence, or from some malign peculiarity of the constitution."

This conclusion Dr. C. founds, among other circumstances, on the particular season of the year, and the condition of the atmosphere, during which puerperal fever is found most commonly to prevail, in conjunction, often, with and under similar circumstances as erysipelas and typhus fever.

"We find," to use his words, "that the same seasons give rise to erysipelas, typhus fever, and puerperal fever; that they prevail epidemically at the same time, and, as an epidemic, take on the same type, and appear capable the one of giving rise to the other, or of coexisting in the same patient. Further, that the symptoms of certain forms, at least, of puerperal fever are similar to those which occur after great surgical operations, and that the secondary lesions are similar. Now, in erysipelas, typhus fever, and the secondary fever after operations, there can be little doubt of the depraved condition of the blood, and it is highly probable that their low typhous character is owing to this blood-poisoning. I think, therefore, the conclusion that the peculiar character and malignancy of certain epidemics of puerperal fever also depend upon a morbid condition of the blood, however produced, in addition to the local disease, is evident."

"Whatever," he adds, further on, "that which we call epidemic influence may be, there can be no doubt that to it the majority of cases of puerperal fever are attributable, especially the worst and most fatal."

On the subject of the contagious or infectious character of puerperal fever, Dr. C. presents his opinion thus:—

"After a close and careful examination of the history of epidemics, of cases recorded, and of the opinions of men of the greatest experience, I believe that the weight of evidence is in favour of puerperal fever being infectious and contagious, *i. e.* that it may be communicated from a patient labouring under it to another who is in contact or close neighbourhood with the affected party."

"It seems impossible to doubt, also, that contagious matter, capable of exciting puerperal fever, may possibly be conveyed by a third party unaffected by it; for example, in the cases on record of puerperal fever following the services of medical men and nurses who were in attendance upon erysipelas immediately before. The instances are too remarkable, and too numerous, to be regarded as coincidences, nor would even the prevalence of an epidemic of puerperal fever at the time invalidate our conclusion; it might, certainly, render the cause more influential."

The additional chapters embraced in the present edition, on tetanus, as an attendant on childbed, on paralysis occurring during gestation and childbed, and on arterial obstruction in puerperal women, the practitioner will find eminently instructive.

In the one on paralysis are comprised all the facts at present known in reference to the subject, collected with much care from the few observations that have been recorded, in which it is expressly noticed, but chiefly from the author's own experience, and from communications furnished him by his professional friends.

The general conclusions deducible from the facts thus obtained are:—

"1. That hemiplegia, paraplegia, or partial paralysis, may occur previous to, during, or some time after labour.

"2. That by some authors the paralysis, in paraplegia especially, is attributed to pressure upon the nerves or muscles in prolonged labour; but this is also denied, as the same disease follows easy labour, or occurs after the lapse of some days.

"3. Paralysis may terminate convulsions, or accompany them.

"4. Paralysis may be the consequence of organic disease, or of effusion into or upon the brain or spinal marrow.

"5. Paralysis may result from reflex action.

"6. The palsy may depend upon temporary causes, and, among such causes, albuminaria may be included.

"7. Hemiplegia may run on into apoplexy, or it may pass off in a few weeks, or sometimes more slowly. Paraplegia may leave a temporary or more perma-

nent lameness; the local paralyses (amaurosis, deafness, etc.) generally last but a moderate time.

"8. A nervous or hysterical paralysis may occur occasionally in the unimpregnated state, or during pregnancy, but that it seldom continues after delivery."

Taken as a whole, we can most confidently recommend the present edition of Dr. C., in the words of the American editor, as "a complete and faithful exponent of the present state of medical opinion and experience in reference to the pathology and therapeutics of the entire range of diseases to which the female sex is liable, including those of pregnancy and childbed."

ART. XVIII.—*Manual of Physiology.* By WILLIAM SENHOUSE KIRKES, M. D., etc. etc. A New and Revised American, from the last London Edition. With two hundred illustrations. 12mo., pp. 584. Philadelphia: Blanchard & Lea, 1857.

THIS manual will long remain a favourite one. It presents precisely such an outline of the facts and generally admitted principles of physiology as is adapted to the wants of those who have just entered upon the study of the science, and that may be conveniently consulted by them during their attendance upon lectures, as well as by those who are preparing for examination, to recall knowledge already acquired, and to correct any misconceptions into which perchance they may have fallen.

The outline presented by Dr. Kirkes is that only of physiology, strictly speaking. Only so much of anatomy, chemistry, and the other sciences allied to physiology, are introduced as could not conveniently be omitted, without rendering the account of many important points obscure and defective. All discussion of unsettled questions, and statements of the conflicting opinions entertained in regard to them by different eminent observers, are omitted. Ample references, however, are given to the sources from whence a knowledge of these may be derived, as well as to those works by the aid of which the study of physiology in its widest extent may be pursued.

The volume is beautifully and copiously illustrated, and in a manner well calculated to enlist the eye in the task of conveying to the mind accurate conceptions of much that would be otherwise obscure, if not unintelligible, especially to the younger student.

In the present edition, by a careful revision, and such additions and alterations as were found necessary, the work is brought up fully to the present date, so as to present a faithful outline of the received facts and doctrines of physiology. D. F. C.

ART. XIX.—*A Manual of the Detection of Poisons by Medico-Chemical Analysis.* By Dr. FR. JUL. OTTO, Professor of Chemistry in Caroline College, Brunswick. Translated from the German by Wm. Elderhorsz, M. D., Professor of Chemistry in the Rensselaer Polytechnic Institute, Troy, N. Y. 12mo., pp. 178. New York, 1857.

THIS manual is intended as an assistant for those chemists who prefer working by rule, and for such as may not be considered as experts, but who nevertheless, by knowledge and practice in manipulation, are qualified to take charge of medico-legal examinations in cases of supposed poisoning. The author is known to chemists by a good manual of chemistry which has passed through several editions in German. The work before us will be found useful in afford-

ing. in a small space, very full and clear details of the methods to be employed not only in investigations where the nature and kind of poisons are indicated by the concurrent symptoms, but likewise in those in which such information is not available as a guide to research. The poisons of a mineral character are first noticed, and occupy the main portion of the Manual, and of these, arsenic and its preparations demand and receive the greatest share. This, either as fly-stone or arsenious acid, is the most common substance, which, either by accident or design, is the most frequent cause of violent death, since its tasteless character gives rise to no suspicion until its effects are felt; and the symptoms produced are, apart from their sudden accession, so similar as to be mistaken for diseases of the same parts, and hence is the most likely case to come under observation. There was a time in which arsenious acid could be given so as to produce slow and lingering disease and death, and yet the cause remain concealed from the imperfections of the analytic methods of those times. At present it would be futile for any to attempt this, and hope that the cause should escape detection, except where suspicion could be entirely allayed or evaded. The present methods of examination are improved to such an extent, and the organs in which the poison locates itself, and becomes for a time detained in the system, so well ascertained, that its detection is one of the most certain problems of analytic research. The different methods of procedure are clearly and methodically stated, and much stress laid on the necessity of absolute purity in all of the chemical substances used, instructions being given as to the modes by which certainty on this point may be attained. A variety of the best methods of examination are given in detail by which the *corpus delicti* in its metallic state may be produced—Marsh, Fresenius, Babo, Wohler, Von Siebold, Otto, Dunty, Duglos, Hirsch, Graham, Danger, Flanden, Rose, Berselius, &c. The whole is concluded by some observations on the doubts which may be raised when the hydrated sesquioxide of iron has been used as an antidote, and the steps to be taken to clear them up by an examination of the antidote itself.

Antimony, tin, lead, copper, zinc, and mercury are also noticed in a similar manner; the space allotted being in proportion to their importance.

Of the poisons derived from the organic kingdom, strychnia has latterly attracted most attention, its activity in small quantities having led, notwithstanding its intense bitterness, to its more frequent use with nefarious intents. The use of this class for poisonous purposes, except in cases of suicide, is comparatively rare; nevertheless, cases may arise in which it may be of legal moment to decide this point. Here the Manual gives an account of such as can be recognized by appropriate tests, and then enters into a detailed account of the methods applicable to the detection of them, whether volatile or fixed, the process of Stas being preferred and given in detail. The disadvantages arising from the use of acetate of lead and animal carbon are pointed out, and in this connection the application of the latter by Graham and Hoffman to the elimination of strychnia, noticed. The methodical arrangement of the subject, and the clear and connected method in which the details are laid down, recommend the work to the attention of those engaged in medico-legal research, as it is in these particulars well adapted not only to those for whose use it is particularly intended, but also as a remembrancer for the more experienced chemist.

The translator has added to the value of the Manual by the introduction of matters of importance which had been either overlooked, or for some reason omitted by the author. He has given a faithful transcript of the original, although in two or three instances some little obscurity appears in too closely following the idiom of the original. The mechanical execution, both as to paper and type, are of a favourable character. R. B.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

1. *On the Physiological Mechanism of the Formation of Sugar in the Liver.*—At the session of the French Academy of Sciences, held in September, 1855, M. Cl. Bernard read a memoir in which, from a variety of experiments detailed, he arrived at the conclusion that sugar, contrary to the views previously advanced, was not directly generated in the liver at the expense of one or other of the elements of the blood, but was produced always by the fermentation of a special substance previously formed.

At the session of 23d March, 1857, M. Bernard announced that the foregoing views had been fully verified by subsequent experiments, and that he had succeeded in isolating the glycogenic matter which precedes the formation of sugar in the liver.

The glycogenic hepatic matter he describes as possessing characters which render it altogether analogous to hydrated starch which has already experienced a commencing change. It is a neuter substance, without smell or taste, communicating to the tongue the same sensation as starch. It is soluble, or perhaps more correctly speaking, suspensible in water, to which it communicates a deep opaline tint. It presents nothing characteristic under the microscope. Iodine develops in it a color varying from a deep violet blue to a clear marroon red, rarely a decided blue. When heated to redness with lime, no ammonia is disengaged, which indicates the non-existence in it of azote. It does not reduce the salts of copper dissolved in potash; it does not undergo the alcoholic fermentation by the addition of yeast; it is entirely insoluble in strong alcohol, and is precipitated from its aqueous solution by the subacetate of lead, animal charcoal, etc.

It is in its conversion into sugar that the analogy of the glycogenic matter to hydrated starch is most clearly shown. All these influences, without exception, which transform vegetable starch into dextrine and glycose, are capable also of changing the glycogenic matter of the liver into sugar, in passing through an intermediate condition analogous to that of dextrine. Thus prolonged ebullition in diluted mineral acids, the action of vegetable diastase, and that of all the analogous vegetable ferments, such as the juice or tissue of the pancreas, the saliva, the blood, etc., readily transform the glycogenic substance into sugar. As this change gradually takes place, the solution of the glycogenic matter loses gradually its opalescence, and also its property of being coloured by iodine. So soon as it has undergone the saccharine transformation, it acquires the power of reducing the salts of copper dissolved in potash, of undergoing the alcoholic fermentation and disengaging carbonic acid upon the addition of yeast. The aqueous solution of the hepatic glycogenic matter does not become changed spontaneously into sugar; when left

to itself it is very slow in undergoing any change, and resists to a certain extent the putrefaction of the cooked tissue of the liver.

Torrefaction, the limited action of ferments, and of the mineral acids, change the glycogenic matter into a substance with characters altogether similar to those of dextrine.

From the several experiments conducted by M. Bernard, it is clearly established that the liver of dogs nourished exclusively upon flesh possesses the special property, enjoyed by no other organ of the body, of generating a glycogenic matter analogous to vegetable starch, and, like it, capable of becoming changed into sugar in passing through an intermediate state like dextrine. Hence, the formation of sugar in the liver is the result of the succession and connection of two acts essentially distinct. The first, exclusively vital, consists in the creation of the glycogenic matter in the living hepatic tissue. The second, purely chemical, consists in the transformation of the glycogenic matter into sugar by the aid of a ferment.

M. Bernard considers the manner in which the contact between the glycogenic matter and its ferment takes place in the living body. He found that the fluid blood possesses the property of changing the glycogenic matter, with great promptitude, into sugar; and this he believes to constitute in the liver the sole ferment. Without entering into the intimate mechanism of the contact between it and the glycogenic material as formed, and the explanation of the physiological causes by which it is varied in activity, M. Bernard simply remarks, that the phenomena of the living organism show, besides the slow and nutritive circulation of the liver, that there is another, intermittent, variable, and the suractivity of which coincides with the appearance of an increased quantity of sugar in the tissue of the organ.

In animals, during digestion, he remarks, the circulation in the vena portæ is surexcited, and then the transformation of the glycogenic matter is much more active, although the formation of this matter does not appear to correspond to this period. The same suractivity of the circulation may be aroused in the interval of digestion, and then the transformation of the matter into sugar takes place in like manner.

In hibernating or benumbed animals, as frogs, for instance, the relaxation of the circulation caused by the diminution of temperature, causes a diminution and sometimes a complete disappearance of sugar in the liver. The glycogenic matter, however, it can be shown nevertheless exists there. It is only necessary to arouse the circulation of the benumbed frog by the application of heat, to cause the sugar to reappear in the liver. Reduce the temperature and it again diminishes or disappears, to again reappear upon subjecting the animal to the influence of an increased temperature. And this alternation, by the same means, may be repeatedly brought about without giving the animal any food.

In hot-blooded animals we can produce similar variations in the production of sugar by the liver by acting upon the abdominal circulation through the nervous system. M. Bernard has shown that when the spinal marrow is wounded or divided below the origin of the phrenic nerves, the activity of the hepatic circulation is considerably diminished, so that, after four or five hours, there are no longer any traces of sugar in the liver of the animal, though its tissue still remains charged with glycogenic matter. He has also proved that, in wounding the cerebro-spinal axis in the region of the fourth ventricle, phenomena directly the opposite are produced, the abdominal circulation is very much accelerated, and, in consequence, the renewed contact of the glycogenic matter with its ferment considerably extended, and hence the transformation of the matter becomes so active, and the quantity of sugar carried into the blood so considerable, that the animal becomes diabetic, in other words, the excess of sugar poured into the blood by the surexcited liver passes into the urine.

Under the two conditions referred to, the nervous system acts evidently upon the purely chemical manifestation of a physiological phenomena. But when we analyze its mode of action, we recognize that the effects are only mechanical, and were directed, in the first place, upon the motor organs of the capillary circulation, and have effected sometimes the diminution or suspension, at others

the augmentation or extension of the contact of the two substances capable of reacting the one upon the other. Giving birth thus to a chemical phenomenon which the nervous system rules indirectly, but upon which it has no direct or primitive action.

"With respect to the conclusions that we are enabled to deduce, in reference to general physiology, from the mechanism thus indicated, in respect to the formation of sugar in the liver, we cannot but be struck with the similarity which exists, in this respect, between the glycogenic function of the liver, and the production of sugar in certain acts of the vegetable organism. In a seed, for example, which produces sugar during its germination, there occur equally two distinct series of phenomena; the one primary and entirely vital, is the formation of starch under the influence of the life of the vegetable; the other consecutive, entirely chemical, and capable of taking place beyond the influence of vitality, is the transformation of starch into dextrine and sugar, by the action of diastase.

"When a liver removed from the living body continues for a certain time still to produce sugar, it is evident that the vital phenomena of the formation or secretion of the glycogenic matter has ceased, but the chemical phenomena continue if the conditions of humidity and heat necessary for its accomplishment are present. In the same manner, in the seed separated from the living plant, the vital phenomena of the secretion of starch has ceased, but, under the influence of the requisite physico-chemical conditions, the starch may be transformed into dextrine and sugar, by the aid of diastase. In fine, it is easy to see, by similar parallel observations, that the formation of sugar in the liver of animals, passes through three successive series of transformations, altogether analogous to those of the formation of starch, of dextrine, and of sugar in the seeds of vegetables."—*Moniteur de Hôpitaux*, April 14, 1857.

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2. *Researches relative to the Influence of Alkali's and Alkaline Carbonates in Destroying Glucose.*—M. Jeannel communicated, some time since, to the Imperial Academy of Medicine, a memoir on this subject, which was referred to a committee consisting of MM. Poggiale, Lecanu, and Caventou.

On the 12th of May, M. Poggiale presented a very interesting report in regard to it, a summary of which we translate from the *Moniteur des Hôpitaux* (May 14, 1857).

The destruction of sugar in the system may be considered as a phenomenon of combustion analogous to those which take place out of the system. Some chemists think that the concurrence of alkaline carbonates is necessary for the decomposition of sugar in the economy, and that in diabetes the passage of glucose into the urine is due to a want of alkalinity of the blood; but direct experiments do not confirm this ingenious theory, which is supported only by analogy. The researches of MM. Lehmann, Bouchardat, and Bernard have proved, on the contrary, that the blood of diabetic persons preserves its alkaline properties; other experiments of Lehmann, Bernard, and Poggiale have proved that the alkalies of the blood do not promote the oxidation of sugar.

Direct experiment and some clinical facts have shown, on the other hand, that certain derangements of innervation, of the circulation, and of hæmatosis appear to render the oxidation incomplete, and to determine the passage into the urine of a certain quantity of glucose.

M. Poggiale, in a memoir presented to the Academy towards the close of the year 1855, examined the action of the alkalies, alkaline carbonates, and bicarbonates upon the glucose out of the system, and it has been demonstrated by many experiments that in the laboratory, as in the system, the carbonate of soda does not act upon glucose, and that it is necessary to raise the temperature of the mixture to 95° for action to take place.

M. Jeannel has employed in his experiments, solutions in distilled water 0.5 gr. per cent. of dried sugar candy, and converted it into glucose by means of tartaric acid.

These solutions of glucose added to various reactive agents have been put to digest for different periods, sometimes in a bottle imperfectly stopped and constantly briskly shaken, at others in a bottle entirely filled and closely stopped.

In the first series of experiments, the author found that in equal weights caustic soda acted more upon glucose than caustic potash did. The result was the reverse when these alkalies were employed in the proportion of their chemical equivalents. Air is not required for the destruction of glucose by the alkalies in excess, but it evidently favors it. The decomposition of glucose by the alkalies is in proportion to the time and the temperature.

Carbonate of potash attacks glucose at the temperature of about 55° in contact with the air, and when it is in great excess it decomposes it even without the presence of air. The difference of the action of the two alkaline carbonates upon glucose is such that it may serve to distinguish them.

The bicarbonates of potash and soda do not act upon glucose at a lower temperature than 90°, and what is singular the bicarbonate of soda has the most marked destructive action.

M. Jeannel nevertheless admits that in consequence of the unknown phenomena which take place in the organism, the bicarbonates diminish the proportion of sugar in the urine of diabetic persons, and consequently exercise some influence over the organic destruction of glucose.

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3. *On a but little known Function of the Pancreas, the Digestion of Azotized Food.*—M. L. Corvisart communicated to the Imperial Academy of Sciences (April 6th, 1857) an interesting memoir on this subject.

Purkinge and Pappenheim asserted (in 1839) that they had obtained from the pancreas a liquid, endowed, like the gastric juice, with the property of dissolving azotized food, but hitherto it has not been proved to possess the power of effecting digestion. The pancreatic juice, in digesting albuminoid aliments, effects in them a transformation identical, or analogous to, that which the stomach produces. But the pancreatic juice acts only on the food which has escaped gastric digestion. The portion of the food transformed by the gastric juice is a *definite product* upon which the pancreas does not act.

Pancreation acts by itself, independent of the surrounding medium ; so that in intestinal digestion, the pancreatic juice, whether neuter, acid, or alkaline, dissolves the same quantity of food, and produces a similar albuminose.

When the two digestive fluids are separated, they exercise their function in full, and thus double the product of digestion. If they come together in their pure state, the two digestions are not performed ; instead of double the quantity being digested, digestion does not take place. The two ferments (pepsine, pancreatine) destroy each other. In the normal state, nature prevents this conflict by three means: 1st, by means of the pylorus which separates the two ferments; 2d, by the gastric digestion itself, during which the pepsine is destroyed ; and 3d, by the bile which destroys in its course the activity of the pancreatine. This conflict has, without doubt, been the cause of my failure, when I have administered pancreatine for the relief of derangements of the second digestion, as I have given pepsin for those of the first. During the digestive period, there is formed as much pepsine as pancreatine ; if the gastric juice appears more abundant, it is because it is more watery ; if the pancreatic juice appears thicker, it is because it is less diluted. The bile does not precipitate the product resulting from digestion performed by the stomach, so that digestion is destroyed, or requires to be done over again ; on the contrary, the acid of the latter precipitates the bile itself. In fact, the precipitate is neither formed nor destroyed in an alkaline medium ; it is the same as regards the bile.—*Moniteur des Hôpitaux*, April 21, 1857.

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4. *Digestion and Absorption of Fatty Substances without the Concurrence of the Pancreatic Juice.*—In July, 1856, M. Colin, of Alfort, read to the Academy of Medicine a memoir on this subject. At a meeting of the Academy on the 21st of April last, M. Berard made an interesting report on this memoir.

We have room only for the following conclusion which he presents :—

" Since in animals, of the bovine species, three or even four days after the excretory duct of the pancreas has been tied, and the pancreatic juice is made to flow out of the economy, there may be obtained from the thoracic duct, in 24 hours, more than 40 litres of perfectly emulsioned chyle, from which may

be extracted by ether a notable quantity of fat, the pancreatic juice in these animals is not necessary either for the absorption of fatty bodies or for the formation of emulsioned chyle."

M. B. says *necessary*, and not *useful*, and his conclusions refer only to animals of the bovine species, though analogy would support him, he states, in further generalizing.—*Moniteur des Hôpitaux*, April 25, 1857.

5. *Alcoholic Fermentation.*—M. Berthelot, in a memoir, read to the Imperial Academy of Sciences (April 6, 1857), states that he has produced alcoholic fermentation in several substances which he had been led to consider as approximating sugars, especially glycerine, mannite, and dulcine. After giving circumstantial details of the circumstances under which this fermentation is produced, he concludes his memoir with the following summary:—

From all the facts which I have stated, glycerine, mannite, dulcine, sorbine, sugar of milk, cane sugar, and glucose belong to the same general class of organic compounds characterized not only by analogous organic composition, physical qualities, and chemical functions, but also by the singular property of being decomposed by the influence of lactic, acetic, and butyric acids. This disposition to ferment, which is very marked in glucose, is less so in cane sugar, still less in sugar of milk and in sorbine, and is called into action with greater difficulty in substances containing an excess of hydrogen, as mannite, dulcine, and especially glycerine.

These substances, which are less readily changed by the action of heat and of reagents, offer also greater resistance to the influence of azotized ferments; nevertheless the similar metamorphoses which they may undergo under this influence tend to ally them with the sugars properly so called.

If we take into consideration that these analogous bodies are abundantly found, free or combined, in vegetable tissues—that they attach themselves directly to the insoluble principles which constitute the network of these tissues—finally that most of the phenomena of vegetable physiology seem to result from their transformations, it will be easy to understand how interesting is the study of their reactions. The metamorphoses which they undergo by means of fermentation offer an especial interest, on account of the resemblance between these phenomena, which are so different from common affinity, and vital phenomena, properly so called. To study fermentations, to guide them at will, so as to produce definite chemical transformations, is to put in play mechanisms analogous to those which preside over the metamorphoses of matter in living beings.—*Moniteur des Hôpitaux*, April 21, 1857.

6. *On the Mode of Action of the Gastric Juice.* Dr. Blondlot, of Nancy, in various papers on digestion formerly published, endeavoured to prove that the gastric juice only produces a softening of the protein or albuminoid matters which facilitates their division by the slightest mechanical means. In a recent paper (*Moniteur des Hôpitaux*, 9 May, 1857) he states a remarkable fact, which may throw some light upon the chemical modification under the influence of which these matters thus lose, in part, their cohesion.

It is known that the gastric juice is but slightly acid, and that without the species of ferment to which this fluid owes its specific powers, its acid principle, whatever may be its nature, would remain perfectly inert in presence of the azotized matters which constitute a part of the food.

With a view of examining the action of more concentrated acids upon these matters, Mr. B. introduced various of these substances, such as cooked and raw meat, many organic tissues, albumen coagulated by heat, &c., into tubes closed at the end, with water acidified with a tenth part of common sulphuric acid, shaking them from time to time, and observed with surprise that under an influence of a temperature of forty degrees, at the end of twenty-four hours, these substances, which had not changed in appearance, and had neither absorbed nor exhaled any gas, had become so softened as to be converted, when stirred with a glass rod, into a species of bouillon apparently homogeneous and perfectly similar to that produced from them by means of the gastric juice. He repeated this experiment a number of times, changing the organic matter sub-

mitted to experiment, and always obtained precisely similar results; different gelatinous substances, especially the gelatin of fish, placed in similar conditions, lost their property of becoming a jelly by cold, precisely as they do under the action of the digestive fluid.

Further experiments have shown that the sulphuric is not the only acid that produces the above mentioned effects as well upon protein matter as upon gelatin. Other inorganic acids produce them also, but with less force. With regard to the organic acids, none soften the albuminoid matters, at least at the temperature of forty degrees and above [below ?]; if heated more, they produce a similar softening. Besides, whatever may be the acid used, the matter preserves all its exterior appearances, and covered by the liquid that has acted upon it, may remain for a long time free from change.

These facts appear to Dr. B. to possess value from the conclusions that we can draw from them. They demonstrate the exactitude of an analogy, some time since indicated by Mr. Dumas, between the gastric ferment (*gasterase* of some authors) and *diastase*, properly so called, in this respect, that the particular action exerted by any of these ferments may also be artificially produced by identical chemical agents, namely, diluted acids.

But as the amylaceous molecule only appropriates to itself the elements of water when either acids or diastase are made to act upon it, it is a legitimate induction that the protein molecule which is submitted to the same influences, is itself only hydrated; only the result of this hydratation is not identical, since the union of water with starch produces a true metamorphosis, resulting in its conversion into sugar, whilst the introduction of water into the protein molecule produces simply a diminution of cohesion.

In support of this theory, which makes the water of hydratation perform so important a part in digestion, Mr. B. states that if we previously dry in a temperature of 100 degrees, the matters submitted artificially to the action of either pure gastric juice or diluted acids, at the temperature of 40 degrees, they prove completely refractory, and do not become any more softened than when placed in simple water, as if a certain degree of natural hydratation, was indispensable to enable the albuminoid matter to combine with the excess of water, which produces its softening, just as happens to certain inorganic products, which, once completely deprived of water, cannot resume it without great difficulty.

On the whole, Mr. B. is persuaded, that the organic principle which characterizes the gastric juice is only a peculiar species of diastase (which he proposes hereafter to name *hydrastase*, to distinguish it from the preceding), and the modification it produces in azotized matters consists in a simple hydratation. This will explain how, whilst preserving their appearance, and without essentially changing their nature, these matters so easily undergo the dissegregation which converts them into chyme.

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7. *Quantity of Air inspired at every* 5, 15, *and* 30 *minutes of the Day and Night, and under the Influence of Exercise, Food, and Medicines—on the Temperature of the Body, &c.*—Dr. Edward Smith, Assistant Surgeon to the Hospital for Consumption, Brompton, communicated to the Royal Society (April 30, 1857) some very interesting experiments on this subject.

This paper was in continuation of a series of inquiries began in 1855, in reference to respiration and pulsation in health and disease, and having for their object to determine the serial changes in the twenty-four hours. Those on the rate of the functions made at every hour of six days and nights, in phthisis, and of three days and nights, in health, have already been published in the *Transactions* of the Royal Medico-Chirurgical Society. This paper is devoted chiefly to the determination of the quantity of air inspired under similar circumstances, but the rate of respiration and pulsation, the depth of inspiration, the temperature, and the barometric pressure, are also recorded. The inquiries were made upon and by the author, and by the aid of a spirometer, consisting of Glover's patent dry gas-meter, of improved manufacture, of reversed action, so as to measure inspiration, and graduated to record from

1 to 1,000,000 cubic inches. When in use, an ori-nasal mouthpiece was employed, connected with the spirometer by vulcanized caoutchouc tubing. The first part of the paper was devoted to a consideration of the total quantity of air breathed in the 24 hours. This was effected by three experiments. 1. By wearing the instrument during 5 minutes at the commencement of every ¼ of an hour, from 5 A. M. to 6½ P. M.; and every ½ hour, from 6½ P. M. to 3½ A. M. Exercise and food were taken intermediately, but sleep was necessarily excluded. The inquiry was always made in the sitting posture. 2. By wearing it continuously during the whole twenty-four hours, except at intervals amounting collectively to 40 minutes, and recording the results every five minutes. Food, exercise, and sleep were taken, and the periods recorded. The mind was occupied in reading or in games, and the whole day passed in a normal condition. No fatigue was felt after the inquiry. 3. By an inquiry similar to the last, but continued only from 6¾ P. M. to 5¾ A. M., and having for its object to determine the precise influence of sleep. In the first inquiry the average returns were, after supper, 354 cubic inches; before breakfast, 358 cubic in.; after breakfast, 445 cubic in.; after dinner, 448 cubic in.; and after tea, 454 cubic in. per minute. In the second inquiry, the minimum quantity was 21,230 cubic in., and the maximum nearly 40,000 cubic in. per hour. The average of the lying posture was 450 cubic in. per minute; and of the sitting posture, 533 cubic in. per minute. The third showed a minimum respiration of 352 cubic in. per minute during sleep. From these facts was deduced the wear of system in various classes of the community, and it was shown that different classes must breathe daily quantities of air, varying from 700,000 cubic in. to 1,400,000 cubic in.

The second part of the paper contained the results of inquiries into the influences of the following agents:—

1. Those which increase respiration—viz., posture of body walking and running at various amounts of speed, walking in the sea, riding on horseback in the various spaces, riding in carriages and on the railway in different classes, and on the engine at various rates of speed, the labour of the tread-wheel, ascending and descending steps, rowing, swimming, Marshall Hall's ready method, reading and singing, carrying various weights at a certain speed, cold bathing; albumen (egg), gelatin, beefsteak, oatmeal, wheaten-bread, potatoes, milk, suet and milk, sugar, rum, tea, coffee, ether, sunlight, heat.

2. Those which decreased the quantity of air breathed—viz: darkness, cold air inspired; all fats, as cod-liver oil, olive oil, butter, beef fat; arrowroot, brandy, wine, kirchenwasser, compound and fetid spirits of ammonia, opium, morphia, hydrocyanic acid, tartar emetic; and salines, as chloride of sodium, and febrifuge medicines.

3. Those which had a mixed effect—viz: chloroform, chloric ether, and amylene. Digitalis first increased and then decreased the quantity.

In each instance the instrument was worn during 5 minutes at one time, and the results averaged per minute. In reference to exercise, that agent was continued from 3 to 10 minutes before the influence of it was sought. When ascertaining the effects of food and medicines, the sitting posture was exclusively selected, and was maintained for some time before the inquiry commenced, and whilst the preliminary observation was made which constituted the basis quantity. An inquiry was made directly after having swallowed the substance under investigation, and repeated during the first quarter of an hour, and subsequently at the beginning of each succeeding quarter of an hour for about two hours. The periods selected for the inquiry were before breakfast and at least three hours after a meal, so as to avoid the perturbing influence of previous food. The author strongly insisted upon the following circumstances being noted and maintained unchanged during such inquiries—viz: posture, sunlight, temperature, season of the year, exertion, and mental emotions. He recorded the number, absolutely and also relatively to the basis quantity recorded immediately before the investigation; but in reference to the influence of food and medicines he believed the latter only to have importance. He found that the various kinds of exercise increased the quantity of air inspired per minute up to seven times the quantity breathed normally in the quiet lying

posture. In reference to food, the most interesting facts were, that whilst all fats and pure starch decrease respiration, sugar largely increases it; and that albumen, gelatin, milk, and all ordinary nitrogenous diet, increase it to a moderate degree only. Also, that whilst brandy, wine, and kirchenwasser greatly decrease respiration, rum largely increases it. Ammonia gave opposite results, according to the preparation and dose, which accounted for the difference of opinion as to its influence. The author was assured of the correctness of Dr. Billing's assertion, that ammonia may be a sedative, and, moreover, that it is a most powerful one. Certain agents, as digitalis, had a contrary action during their influence, first to increase, and then to decrease respiration. The most powerful respiratory excitants were—ether, tea, and sugar; and the most powerful depressants were, some preparations of ammonia, opium, morphia, tartarized antimony, kirchenwasser, and sleep; and these, with salines, which have the same action, are the common antiphlogistic and febrifuge remedies. Sunlight increased, darkness decreased respiration; heat increased, and cold decreased respiration, when the difference was considerable; cold applied to the skin increased, but cold air inspired decreased respiration.

In the third part were contained the results of inquiries into the temperature of the expired air, showing that it was from 4° to 8° lower when inspiration had been effected through the mouth than through the nose—a fact teaching the importance and the benefit of breathing through the nostrils only in cold weather. It was also proved that a part of the body may have its temperature increased by friction, &c., 20° in a few minutes, without having received any increase of heat externally—a fact implying that under such circumstances the heat of the surface is rather due to a larger distribution of blood there than to any increased generation of heat.

The tables and diagrams accompanying the paper contained the record of 1200 series of observations, and various deductions of professional and general interest were appended. The subject was entirely novel, as previous observers had limited their attention to the chemical changes in respiration, and at irregular intervals only.

Professor Sharpey bore testimony to the careful precautions and patient labour with which the author's experiments had been made, as peculiarly calculated to lead to trustworthy results. It was a curious circumstance that brandy and rum should act differently on the respiration—the former decreasing, the latter increasing it. He (Dr. Sharpey) agreed with the opinion expressed by Dr. Thompson, that with increase of respiration, an increase of carbonic acid must be expected, although not necessarily proportional. The inquiry instituted opened questions of remarkable interest. The different amount of respiration in men and women was curious. Andral and Gavarret, for example, had observed that the amount of respiration in women, particularly after puberty, was much less than that of men. Dr. Smith's remarks on the influence of light confirmed those of other investigators. Frogs had been observed to have their respiration increased by this agent. He (Dr. Sharpey) believed not only through its influence on the skin, but probably also through the medium of the eye. He considered that the harmony between the author's results and those obtained by the best previous observers was evidence of their truthfulness.

Professor Carpenter gave an interesting description of the apparatus employed by the author, and showed the great advantage derivable from a lengthened and continuous series of observations, so contrived as to avoid the restraint and discomfort which some other modes of experiment involved, whilst free from different sources of uncertainty present in observations made in confined chambers without the use of any apparatus. Carrying out such observations continuously for twenty-four hours without fatigue implied normal conditions. Dr. Carpenter referred to the remarks made on light and darkness in relation to respiration. He knew of instances in which persons were affected with laborious and distressing breathing if the candle was extinguished during their sleep. Such instances were extreme, but they were favourable to the opinion that light under ordinary conditions had some effect as a stimulus to the reflex actions concerned in respiration.

8. *Complete Obliteration of the Thoracic Aorta.*—Mr. Sidney Jones describes (*Med. Times and Gaz.*, May 16, 1857) the following unique specimen. The subject from which it was obtained was brought into the dissecting-room of St. Thomas' Hospital, from a workhouse. He was a male, and aged forty-five years, but no particulars as to his state of health could be obtained beyond the account that some little time ago he had been under care in Guy's Hospital on account of chest disease. His lungs showed evidences of past inflammation. It was evident that the condition of the aorta had existed for a long time, and most probably the collateral circulation had become sufficiently established to prevent any material inconvenience from being felt. There was no reason to think that this lesion had anything to do with the fatal illness. The specimen, carefully dissected and in a dried state, now forms part of the St. Thomas' Museum. The obliteration is situated at the commencement of the descending thoracic aorta, just below the junction of the ductus arteriosus with the termination of the arch. In the dried state it looks as if merely a constriction of the vessel existed; but in the recent state the obliteration was seen to be complete, a ligamentous cord about half an inch in length uniting the two ends of the artery.

Just above the obliteration is a quantity of atheromatous deposit, involving at that point nearly the whole circumference of the vessel. The arch is much enlarged, as are also its three arterial trunks. The latter were at least double their usual calibre.

Below the obliteration the aorta forms a bulbous dilatation, which extends about the length of two vertebræ, viz., from the upper border of the fifth to the lower border of the sixth dorsal vertebra. Its diameter is very much increased, and varies from an inch and a half to two inches. Opening into this dilatation are four intercostal arteries on each side; those of the right side are somewhat the largest, the upper one being about the size of a very large goose-quill. They are very tortuous, and gradually diminish in size from above downwards, the sixth intercostal on each side having about its normal diameter.

The aorta below the dilatation is also enlarged, but begins to assume its normal calibre opposite the upper border of the ninth dorsal vertebra, having gradually diminished in size, and being thus rendered somewhat infundibuliform.

The *first aortic intercostal* of the *right* side is very tortuous, passing outwards between the third and fourth dorsal vertebræ, to the head of the fourth rib; then ascending vertically to the head of the third rib; having first given off from its inner side a branch, about the size of an ordinary radial, which runs upwards along the centre of the bodies of the three upper dorsal vertebræ, and anastomoses with a branch from the inferior thyroid of the subclavian. The artery (*i. e.* first intercostal) turns outwards above the third rib, gives upwards a large branch, which anastomoses with the superior intercostal of the subclavian, and then divides into two branches; one continues its course between the second and third ribs, the other is double its size, and passes through to the back.

The *second and fourth right aortic intercostals* are large, and divided likewise into an anterior and posterior branch; the posterior branch in each case is much larger than the anterior.

The *third intercostal* of this side is much smaller than the first, second, and fourth, and gives off a very small posterior branch, the greater part of the artery continuing its original course.

The *first aortic intercostal* of the *left* side has its calibre somewhat less than that of the opposite side; it is very tortuous, and ascends to the interval between the second and third ribs; it gives off one branch (size of small radial), which runs behind the œsophagus, and anastomoses with a branch of the inferior thyroid. It then divides into an anterior and posterior branch, the last of which forms the greater bulk of the artery, the anterior not being much larger than an ordinary intercostal.

The posterior branch of the *second aortic intercostal* of this side is much larger than the anterior; the other intercostal arteries of this side have their posterior branches much smaller than the anterior.

Branches of Right Subclavian.—The internal mammary and transversalis colli arteries are very large, and have a diameter little less than an ordinary subclavian. The transversalis humeri is also large, and takes its origin from the third part of the subclavian.

1. *Transversalis colli.*—The posterior scapular branch takes its ordinary course along the vertebral costa of the scapula; its principal branches are directed inwards, three or four large trunks running inwards, and anastomosing directly with the large posterior branches given off from the intercostal arteries.

2. *Internal mammary.*—The branches given off from the outer side of this artery, and which run along the three or four upper intercostal spaces, are large, and anastomose directly with the anterior branches of the intercostal arteries. The musculo-phrenic forms free anastomoses with the diaphragmatic arteries of the abdominal aorta.

3. *Inferior thyroid* is larger than usual; its glandular branches are about their normal calibre; a branch runs downwards and forwards to the œsophagus, and meets an ascending branch, given off from the first aortic intercostal.

4. The *vertebral* is of little more than ordinary diameter.

5. The *superior intercostal* is about the size of the internal mammary and transversalis colli arteries; it gives off a large deep cervical branch, and then continues its course tortuously to the first intercostal space, at which point a large posterior branch is given off.

Branches of Left Subclavian.—The vessels of this side are given off just as on the right side, but their calibre is smaller. The subclavian on each side is reduced to at most half the diameter it had before the giving off of its trunks. The deep epigastric on each side is very large, having about the diameter of the corresponding internal mammary; very free anastomoses are formed between it and the last-named artery.

We find, therefore, that the principal communications by which the circulation was carried on are—

1. The *internal mammary*, anastomosing with the intercostal arteries by means of the musculo-phrenic and comes nervi phrenici, with the diaphragmatic of the abdominal aorta, and largely with the deep epigastric.

2. *Superior intercostal*, anastomosing anteriorly by means of a large branch with the first aortic intercostal, posteriorly with the posterior branch of the first aortic intercostal.

3. *Inferior thyroid.*—A branch, about the size of an ordinary radius, forms a communication between the first aortic intercostal and this vessel.

4. *Transversalis colli.*—Very large communications with the posterior branches of the intercostals. The size of this artery, with its large anastomosing branches, first led one to look for some obstruction.

6. The branches going to the side of the chest were large, and anastomosed freely with the lateral branches of the intercostals.

MATERIA MEDICA AND PHARMACY.

9. *Experiments on the Action of Pepsin.* By Edward H. Sieveking, Lect. on Mat. Med.—Those who have employed pepsin in the treatment of dyspepsia will probably be disposed to admit that it possesses a considerable therapeutic value. Into this question I do not now propose to enter; but as it is likely that the more extended use of the article, provided that we can secure its being properly prepared, will establish its claim to a permanent place in our materia medica, it may not be uninteresting to relate a few experiments that I have recently made with pepsin. The experiments were made with specimens of Boudault's pepsin,[1] of Trommsdorff's pepsin, and of Oberdörffer's[2] dried pig's stomach. Boudault's pepsin (poudre nutrimentive) is acid to the taste, and to litmus, owing

[1] Obtained from Messrs. Squires', the Queen's Chemists.

[2] These two specimens were kindly supplied to me by Messrs. Hilgenberg and Schacht, of Houndsditch.

to the lactic acid it contains; it is a stone-gray powder, consisting mainly of starch and *débris* of epithelium, as shown respectively by the iodine test and the microscope. Trommsdorff's pepsin is also a stone-coloured powder, caking and gritty to the touch, strongly acid to the taste and to litmus paper, and very hygroscopic; under the microscope, the whole appeared composed of starch-granules of various sizes, which gave a blue reaction with iodine. On addition of water, the granules swelled, became ovoid, and showed faint concentric lines, with here and there a radiating fissure.

The dried scrapings of the pig's stomach also presented a stone colour, but of rather a more reddish hue; the substance was pulverulent and soft, acid to test paper, and consisting of epithelium and *débris* of animal tissue; not materially altered by the addition of acetic acid, and containing a few ovoid particles, which were blued by iodine.

Of each of these I weighed out two specimens of 4 grains each, and submitted cubic pieces of hard-boiled white of egg, of 20 grains each, in half an ounce of distilled water, to their action. To one specimen of each, one drop of strong hydrochloric acid was added, and the whole series was exposed to a temperature of 100° Fahr. The glasses were left for above twenty-four hours, and the following is a summary of the effects produced:—

The albumen treated with—

	Loss.
1. Boudault's pepsin, weighed over 16 grs. . .	nearly 4 grs.
2. " " with hydrochloric acid, weighed under 10 grs. . . .	above 10 "
3. Trommsdorff's pepsin, weighed over 18 grs. . .	" 20 "
4. " " with hydrochloric acid, weighed over 12 grs. .	" 8 "
5. Pig's stomach, weighed over 20 grs.	
6. " " " 15 grs.	5 "

In the case of 2 and 4 the action was very marked, the edges of the albumen were rendered extensively clear and transparent. Nos. 1 and 3 looked as if they had scarcely been affected; No. 6 was slightly digested, but much less than Nos. 2 and 4. The albumen in Nos. 3 and 5 looked as if it had undergone no change, and it was manifest that No. 5 had even absorbed water, and had thus increased in weight. The liquid was in each case tested for albumen; feeble indications of its presence were afforded by the water of Nos. 2, 3, 4, 5, and 6.

About a fortnight after the last series of experiments I repeated them, with nearly the same results. The same quantities of white of egg and pepsin were used, two drops of hydrochloric acid were added to one specimen of each kind, and the whole was exposed for some hours to a temperature of 110° F., and the glasses shaken from time to time. At the termination of the experiment, the albumen in—

1. Boudault's pepsin, weighed 15 grs.	5 grs. loss.
2. " " with acid, weighed 12 grs. . .	8 " "
3. Trommsdorff's pepsin, weighed 17½ grs. . . .	2½ " "
4. " " with acid, weighed 17 grs. .	3 " "
5. Pig's stomach, weighed 21 grs.	1 gr. gained.
6. " " with acid, weighed 8 grs. . . .	12 grs. loss.

It is stated in my notes that the liquid of Nos. 1, 2, and 4 gave feeble indications of the presence of albumen. The albumen in Nos. 2 and 6 had become translucent to a great extent, while the albumen in the other glasses remained opaque. The discrepancy between the two serials is, that in the second the action of the pig's stomach with the acid was so much greater than Trommsdorff's pepsin, or even than Boudault's. The two sets of experiments agree in demonstrating that in all instances the solvent power of the preparation was much promoted by the addition of the hydrochloric acid; and that imperfect pepsin (as in No. 5 in each set) not only does not promote, but actually retards, digestion. We must not, therefore, allow our dyspeptic patients, on the mere

strength of the pepsin we prescribe, to take a larger quantity of food in the first instance than we should otherwise order, but make certain of the peptic power of the agent in the first instance, or we may aggravate instead of relieving his complaint. It is evident, also, that Boudault's is a powerful and trustworthy agent.

In submitting the above memoranda, I would only add that the conclusions I have arrived at in relation to the therapeutic value of pepsin corroborate those put forward by Drs. Corvisart and Ballard, and that I regard pepsin as an agent which we may in many diseases of malnutrition prescribe with great benefit to our patients.—*Med. Times and Gaz.*, April 4, 1857.

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10. *Chemical and Physiological Properties of Pepsin.* M. BOUDAULT read an interesting memoir on this subject before the *Société de Pharmacie* of Paris, of which the following is an abstract. Pepsin is a compound found in the gastric juice of animals, from which it is obtained as a syrupy substance, by simple evaporation. It is also precipitated in a neutral state by alcohol. Metallic salts throw it down without altering its physiological properties, which reappear when the pepsin is separated from the salts which have precipitated it. Gastric juice contains 1.25 of pepsin, and 1.75 of saline matters; the rest consists of water and lactic acid, which latter plays an important part in the phenomena of digestion. From his experiments M. Boudault concluded that pepsin is secreted in the neutral state, but that it is to its action as a ferment that the gastric juice owes its property of converting glucose into lactic acid. On the other hand, he proved that pepsin alone, that is, in the neutral state, cannot effect digestion; it is only when glucose is changed into lactic acid that digestion can take place. Hence the sequence will be, the salivary diastase transforms the amylaceous principles of the food into glucose, which is conveyed into the stomach; there this glucose meets all the elements necessary to its change into lactic acid, and especially pepsin, the principal agent in this modification, whence results the formation of gastric juice, and consequently digestion.

Lactic acid is not, however, the only acid capable of effecting digestion. Pepsin, acidulated with hydrochloric and acetic acids, also determines the formation of gastric juice; but digestion is never so complete as with pepsin, acidulated with lactic acid.

M. Boudault detailed some experiments demonstrating the equal efficacy of artificial gastric juice prepared by himself, from pepsin obtained from the rennet of the sheep, with that of the natural fluid obtained from dogs.

The employment of pepsin as a medicine was naturally suggested by its energetic action as a digestive substance. Dr. Corvisart, who was the first to use it, obtained satisfactory results, and it was the pepsin of herbivora which he employed (*Bulletin de Thérapeutique*, vol. 47, p. 320). M. Boudault administers pepsin mixed with starch, dried at a temperature of 212° F. In this form it can be mixed with a number of medicinal substances, which do not interfere with its therapeutic action. For example, with hydrochlorate of morphia, in cases of violent cardialgia; with strychnia, where it is desirable to stimulate the peristaltic motions of the stomach; with subnitrate of bismuth, lactate of iron, carbonate of iron, iodide of iron, reduced iron, &c.

Pepsin is very efficacious in dyspepsia, and in the derangements of digestion which usually attend recovery from serious or chronic diseases. Finally, it is a powerful digestive agent in cases of consumption from insufficient nourishment.

It is given in the first spoonful of soup, or before meals, rolled up in a wafer, and either in the acid or neutral state. In the former condition it replaces the gastric juice, when the latter is not secreted in sufficient quantity in certain morbid affections; in the neutral, that is, the slightly acidulated state, it is used in cases where the stomach contains too great a quantity of acid. It is a powerful remedy.—*Bulletin Général de Thérapeutique*, 30th January, 1857.

Dr. W. Stephens Squire gives the following as M. Boudault's process for the preparation of pepsin. The rennet bags of sheep are opened and reversed, and washed under a thin stream of water, to free them from alimentary mat-

ters, &c. The mucous membrane is then carefully scraped off with a knife, the cells are bruised in a mortar, and digested for twelve hours in distilled water. The liquid is then filtered, and neutral acetate of lead is added, which precipitates peptate of lead. This precipitate is collected and decomposed by means of sulphuretted hydrogen. Pepsin is thus liberated in solution, and is separated from the insoluble sulphide of lead by filtration. The filtered liquid represents neutral gastric juice. It is, however, necessary that it should be acid, and for this purpose lactic acid is added until the liquid exhibits the same degree of acidity as a specimen of gastric juice obtained from the stomach of a dog by means of a fistulous opening. If the artificial gastric juice thus obtained be evaporated to dryness, at a temperature not exceeding 100° F., a gummy mass is obtained, which attracts moisture from the air, and is altogether a very unfit article either for sale or administration. In order to reduce it to powder, M. Boudault simply evaporates his artificial gastric juice to a syrupy consistence, and to this he adds dried starch in such proportion that one gramme shall be capable of digesting four grammes of dry fibrin, when the two are submitted together in the presence of water to the temperature of the human body.

The substance thus produced is a fawn-coloured powder, cohering somewhat together, and possessing a peculiar taste and odour. It yields to water the lactic acid and the pepsin, producing a solution of a yellowish tint, with the colour, odour, and taste of gastric juice.—*Pharmaceutical Journal*, March, 1857.

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11. *Therapeutic Employment of the Pyrophosphate of Iron.*—M. E. Robiquet read (Feb. 10th, 1857) an interesting memoir on this subject before the Imperial Academy of Medicine of France.

"Since," he remarked, "Mr. Graham made known the singular transformations produced by heat in phosphoric acid, chemists have carefully studied the saline combinations into which the acid, molecularly modified, is capable of entering. The most interesting of these salts are those formed by simple igneous fusion, and, therefore, called pyrophosphates, and for this reason that the pyrophosphoric acid corresponds to two equivalents of base. Industry has already derived great advantage from the property possessed by pyrophosphoric acid of combining with soda, and with gold or silver. In medicine, the pyrophosphate of iron has often been tried, and this might be expected, for oxide of iron undoubtedly reacts on the functions of the blood, and the elements of pyrophosphoric acid are found in the bones; but it has soon been given up on account of its liability to change, and of the great quantity of pyrophosphate of soda necessary to retain it in solution in water. It struck me that these inconveniences might be easily avoided without depriving the ferruginous salt of any of its essential properties.

In medicine the essential characters of a good preparation of iron are, that it shall readily dissolve in the fluids of the stomach without impairing their digestive functions, that it shall be completely assimilated in the system, and that it shall not act as an astringent. The pyrophosphate of iron possesses all these properties; its resistance to solvents is the sole difficulty which remains to be overcome to entitle it to the first rank among the preparations of iron.

In studying the molecular constitution of this remarkable salt, it is easy to see that it belongs to the class of bodies endowed with the character of polymorphism. Like sulphur, phosphorus, arsenious acid, and many other polymorphous substances, pyrophosphate of iron will therefore present great differences in its chemical properties, according to the process adopted in its preparation, and the temperature at which it has been obtained. By precipitating a solution of persulphate of iron with one of pyrophosphate of soda, taking care to operate at a temperature below 59° F., we obtain a gelatinous precipitate, which is nothing else than pyrophosphate of iron ($Fe_2 O_3 3Ph O_5$), dissolving with the greatest facility in a solution of pyrophosphate of soda. If the ferruginous salt were obtained at a temperature above that just mentioned, and, *à fortiori*, at a boiling heat, a considerable quantity of pyrophosphate of soda would be required, and still we should obtain only an unstable

solution, acquiring a black colour, and having an insupportable taste. In fact, whatever precaution we take, not less than four parts of pyrophosphate of soda are required to dissolve sixteen of the gelatinous ferruginous precipitate, representing three parts of the salt dried at 212°. When the solution is prepared in the cold, it keeps for some time without change, and might be converted into a syrup which would keep tolerably well in close vessels for one or two months. However, such a mixture contains too large a proportion of pyrophosphate of soda, which gives it a disagreeable saline taste, and does not prevent it, after a longer or shorter interval, from blackening on exposure to the air, and acquiring a more and more decided metallic taste. It was, therefore, necessary to seek for another solvent. That which I have found to succeed best is the citrate of ammonia, a salt which has the double advantage of being capable of employment in very small quantity, and of chemically concealing iron from reagents.

The solution of pyrophosphate of iron in a citro-ammoniacal liquor keeps for whole months without undergoing any change, and yields a syrup free from the intolerable taste of ferruginous compounds. Potash, ammonia, and the alkaline carbonates, do not give, with pyrophosphate of iron so dissolved, the reaction peculiar to the salts of iron.

MM. Dumas, Laurent, and Gerhardt, in their valuable researches on the theory of substitution, have shown that it is possible, in a number of organic compounds, to substitute iodine, bromine, or chlorine, for hydrogen, without disturbing the molecular equilibrium, or the chemical reactions of the fundamental compound. Thus, in chloruretted alcohol or chloral, nitrate of silver produces no turbidity, because the chlorine of the chloral behaves, not as the chlorine of hydrochloric acid, or of a metallic chloride, but as the hydrogen of which it has taken the place. Now, destroy the chloral, either by combustion by nitric acid, or by any other energetic oxidizer, and you will rediscover the chlorine with all its characteristic reactions. In like manner, in the salt of which I am treating, the iron is chemically concealed; its presence is no longer manifested by the most sensitive reagents; potash and ammonia no longer precipitate it as an oxide; and its properties are so masked that it is necessary completely to break up its molecule in order to be able to estimate the iron, or to discover its reactions.

If I enter a little at length into this subject, it is because I am persuaded that therapeutics will one day derive the greatest advantage from medicines, the active element of which is chemically concealed. Such compounds are, in fact, very slowly disaggregated in the process of digestion, and the system, absorbing them atom by atom, will conceal them integrally.

The process of solution being once found, nothing is easier than to transform the pyrophosphate of iron into comfits, syrup, or lozenges; the latent state in which it exists in this new salt enables us to mix it with wine of bark, and to obtain from it a powerful tonic, without having to fear the blackish discoloration and inky taste which are always produced when a salt of iron is brought into contact with fluids more or less highly charged with tannin.

In whatever mode the citro-ammoniacal pyrophosphate of iron be administered, it has absolutely no taste, and patients not only bear it readily, but feel the best effects from its use. I have seen it particularly useful in well-marked cases of anæmia, chlorosis, and chronic urethritis.

To recapitulate, the pyrophosphate of iron, chemically considered, is a polymorphous salt, in which the metallic atom is concealed from reagents; it contains, by weight, 21.11 per cent. of iron. In a therapeutic point of view, the facility with which it is assimilated by the system, the absence of all styptic taste, its perfect solubility in water, the influences, finally, which it exercises on the composition of the bones and the functions of the blood, entitle it to the first rank among ferruginous compounds.

Formulæ. *Syrup of Iron.*—Pyrophosphate of iron, two and a half drachms; simple syrup, twenty-nine ounces; syrup of orange flowers, three ounces; make a syrup by simple solution, and colour with a sufficient quantity of tincture of cochineal or alkanet. Each drachm of the syrup contains about six-tenths of a grain, and a tablespoonful about three grains, of the salt of iron.

Ferruginous Comfits.—Pyrophosphate of iron, one ounce and five drachms; divide into 500 comfits, each of which shall contain a grain and a half of the salt.

Ferruginous Wine of Bark.—Pyrophosphate of iron, two and a half drachms; extract of pale bark, seventy-seven grains; white wine, thirty-two ounces; to be made *secundum artem.*"—*Journ. des Connaissances Méd. et Pharm.*, Feb. 20, 1857.

12. *Therapeutic Properties of Iodide of Potassium.*—MM. DEMARQUAY and GUSTIN communicated to the Imperial Academy of Medicine (April 7, 1857) a note on this subject. They state that the favourable effects obtained from the use of the chlorate of potash in different affections of the buccal mucous membrane, have led them to inquire whether the therapeutic properties of this salt were not common to other salts having a striking chemical analogy with it. Profiting by this idea they have tried the past year, in the service of M. Monod, the iodide of potash, and they state that their confidence in it augments daily. They think it may replace the chlorate of the same base, the iodide acting more promptly, more energetically, and in a less dose than the chlorate. Further, they say that the iodide has been beneficial where the chloride had failed.—*Moniteur des Hôpitaux*, April 11, 1857.

13. *Employment of Amylene for Children.*—M. GIRALDES, as the result of the employment of amylene in place of chloroform in the cases of twenty-five children of different ages, draws the following conclusions: 1. It is respired more easily and with less struggling than chloroform. 2. Anæsthesia takes place very rapidly. 3. The sleep is more calm and natural, and is unaccompanied by stertor. 4. The patients rapidly return to their normal conditions. 5. It does not induce nausea, vomiting, or cerebral congestion. 6. The patients suffer no inconvenience afterwards, recovering all their cheerfulness.—*Comptes Rendus*, No. 10, 1857.

14. *External Use of Clay.*—Dr. BETZ employs clay mixed with water, and spread some lines in thickness upon rag, as a poultice in cutaneous, cellular, and lymphatic inflammations, in panaritis, periostitis, periphlebitis, etc. The application must be often renewed. He believes its utility is attributable to the great affinity the clay has for water, so that, sprinkled upon suppurating surfaces, it quickly causes the absorption of the fluids, and the formation of a crust. So, also, it absorbs water through the uninjured skin, which becomes wrinkled. Its influence may be further attributed to its low temperature.—*Med. Times and Gaz.*, April 4, 1857, from *Schmidt's Jahrb.*, Bd. 93.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

15. *On the Diseases of the Army of the East during the winter of* 1854–5.—By Dr. THOLOZAN. When the sickness began to show itself in large proportions in the French army, M. Tholozan was among the civilians dispatched by the Government to the seat of war. In the present paper he presents to the Académie de Médecine a succinct account of some of the facts he observed at Constantinople from December, 1854, to March, 1855. During this period, he received about 1200 patients sent from the Crimea. In about a fourth of these, the affections were slight and easily treated; but 900 were the subjects of severe disease, and of these 290 died.

The diseases which gave rise to this mortality were the same that filled all the other hospitals of the Crimea and Constantinople, viz., cholera, dysentery, scorbutus, and typhus. The cholera, here as in other armies, was due to an

accidental morbid influence arising from the choleraic medical constitution which prevailed at the beginning of the war over a large portion of Western Europe. It is not a disease proper to armies, though it often shows itself among them when epidemic or endemic influences favour its development. What had been already observed in India, Russia, Poland, and Algeria, exhibited itself with identical pathological and epidemiological characteristics in the Crimea. It is quite otherwise with regard to scorbutus, typhus, and dysentery, which arise in armies, crowded garrisons, and besieged towns, displacing, under these circumstances, other forms of disease which are observed in ordinary military life, during a period of peace. Thus, acute phthisis, which, in England, France, and Germany, is a common disease in the army, and stands in the foremost rank among the causes of death, is met with during a campaign only in very small proportions. Typhoid fever, so frequent in hospitals, is seldom met with under the hygienic conditions of actual warfare. The same may be said of eruptive fevers and acute rheumatism.

Dysentery, scorbutus, and typhus, as they are known in our classical descriptions, form morbid groups totally distinct from each other, and, thus isolated and simple, are easy of recognition. But when they are combined and complicated with each other, forming, as so often observed in army practice, compound diseases, the pathological problem becomes very complicated. Dysentery presents the characters of scorbutus, the scorbutic exhibit the delirium of typhus or sink under dysenteric discharges, while the subjects of typhus suffer from dysentery and become scorbutic. At Constantinople, almost all the grave cases presented these complications, and it was only exceptionally that the part due to each affection could be assigned. Usually, the signs proper to one of these morbid entities disappeared, and were replaced by others of a less importance. Thus, the characteristic eruption of typhus, so well described by Jenner, was rarely seen when the typhus was complicated by dysentery; the continuous fever, characteristic of it, disappeared also, while delirium, sometimes very intense, persisted; at other times, there were but cephalalgia, vertigo, singing in the ears, and restlessness, without febrile heat. Dysentery was eminently contagious and engendered typhus. In scorbutus complicated with dysentery, changes in the gums and hemorrhagic discharges were absent, and scorbutic pains, anæmia of the gums, and a cadaverous aspect, were the only signs of scorbutic cachexia. At other times, the symptoms of typhus were suddenly arrested, and replaced by those of scorbutus in its gravest form. More frequently, the scorbutus and typhus were combined, and then were observed fever, œdema of the face, sub-icteric colour of the skin, delirium more intense and more obstinate than in ordinary typhus, and bad gangrene of the mouth and extremities. So, too, scorbutic dysentery presenting typhus symptoms was often met with, and, reciprocally, the typhus of scorbutic patients offering the characters of dysentery.

The author made a most laborious examination of the cases that came under his care both in the wards and in the dead-house; and he reserves most of the data so obtained for a more detailed publication. On the present occasion, he confines his attention to the necroscopic results, believing these to be of great interest as illustrating what has been but little studied—the pathology of armies in the field during winter.

Among 79 autopsies, the brain or its membranes presented important changes 47 times, viz: 1. In 18 in the pia-mater; the change consisting in simple œdema in 15, in sanguinolent in 1, and in purulent infiltration in 1. 2. In 13 there were changes in the vessels; these being in an anæmic condition in 10, hyperæmic in 1, and in 2 the seat of capillary apoplexy. 3. In 33 the substance of the brain had undergone changes; there being in 6 well-marked general ramollissement, in 9 well-marked induration, in 10 periventricular ramollissement with ventricular dropsy, in 2 induration and dropsy of the ventricles, in 4 dropsy without change of the walls, in 1 ramollissement of the walls of the 4th ventricle, and in 1 abscess of the brain. These lesions were sometimes combined with each other. Thus œdema of the pia-mater and anæmia of the brain were most frequently observed coinciding with increase of the ventricular fluid. Many other lesions might have been enumerated if the author had not confined

his account to such as were sufficiently marked to be beyond all doubt, and were important enough to figure as causes or results of disease. It may be asked to what morbid influences were these lesions due, inasmuch as none of the diseases above adverted to give rise to such. At first sight, typhus, which is always accompanied by perversion of the functions of the nervous system, might seem the determining cause; but pathological induction teaches us that the nervous symptoms met with in typhus, as in typhoid and in eruptive fevers, are not the product of palpable changes in the cerebral substance. Thus, in typhoid fever, the most intense delirium does not coincide with the most marked hyperæmia of the brain; and, in the torpid stage of cholera, much less injection is found after death than in the algid period, during which the intellect is quite undisturbed. Moreover, clinical observation proved that in several of these cases, in which the cerebral changes were most marked, there had been neither delirium nor coma, such patients having been among those who had become emaciated and enfeebled by obstinate diarrhœa. Others, again, dying in this same condition, with delirium and coma, exhibited the same alterations; while in a third category were patients who had not suffered long, preserved their flesh, and exhibited severe cerebral symptoms, and yet in whom these appearances were not observable after death. The few times the spinal marrow was examined, it revealed alterations analogous to those observed in the cerebral substance. Not being able to determine the nature of these lesions, the author contents himself with bringing them under the vague general title of *vices de nutrition*, intending thereby to indicate that they completely differ in their nature from inflammation.

Of the same nature were the lesions of the thoracic and abdominal viscera, some of which were always found accompanying those of the nervous system. In respect to the heart, it was observed (in the 79 autopsies) notably reduced in volume 26 times, its tissue was decoloured or whitish in 23, yellowish in 1, and in 18 atrophied as well as decoloured. In one case only was the change in colour accompanied by increase of fleshy tissue, while in 9 there was diminution of consistence or friability. 31 weighings of the heart in these cases gave as the mean weight in men from 24 to 35 years of age 53¾ drachms, the highest weight observed having been 73¼, and the lowest 31¼ drachms. The liver, together with some alterations only seen in certain cases, presented others which, by their frequency and their coincidence with grave lesions of the brain and heart, acquired a greater importance. In 29 instances among the 79, notable reduction of volume was observed. The mean weight in 27 weighings amounted to 413⅜ drachms, the maximum weight being 645, and the minimum 202½ drachms. In 4 instances the weight did not reach 278 drachms, and in 12 it did not reach 325 drachms. In the case of the minimum weight, the reduction of volume was so remarkable as, at once, to challenge notice. In most cases there was no change in the colour of the organ, it being neither anæmic nor hyperæmic. Changes were observed in the kidneys 48 times, there being notable diminution in size and weight in 14 instances, hyperæmia in 11, and increase of cortical substance in 8.

Diseases of the lungs, which are of such frequent occurrence in the hospitals of garrisons, even when under the best hygienic condition, disappear in part in camps during winter, when all would seem to favour their production. In 21 cases pulmonary or pleural lesions were noted, 5 only of these being tubercular. Changes in the gastro-intestinal mucous membrane were the most frequent of all the lesions. In two-thirds of the cases seen by the author, *i. e.*, in 700 or 800 patients out of 1200, diarrhœa had preceded the morbid conditions which led to the hospital, the stools in one-third of these having been sanguinolent. In 1100 out of the 1200 patients there had been more or less diarrhœa, either at the commencement or during the course of these affections. The 79 autopsies exhibited changes in the large intestines 63 times, in the small 42, and in the stomach 38 times. Ulceration in the large intestines, abnormal follicular development in the small, and small ulcerations in the stomach, were the chief changes observed. The submucous tissue of the bladder, in 8 out of 45 cases in which it was examined, presented small roundish spots of ecchymosis. The spleen was found enlarged in 24 instances, and enlarged and

friable in 10; but both its dimensions and ramollissement were less than those observed in typhoid fever.

After noticing the numerous changes in the appearances of the skin, the author goes on to say that the fatty tissue of the sole of the foot and palm of the hand, that which forms the cushion on which the ligament of the patella rests, and that which is found at the tibial extremity of the femur, presented, in the 79 autopsies, curious alterations 27 times. With a normal condition of the dermis and aponeurosis, the subcutaneous fatty vesicles were found more or less highly injected, the yellow colour of the fat being concealed by the injected, or even ecchymotic, condition of the cellular covering. It was not a subcutaneous ecchymosis, but a little-known, peculiar anatomical condition of the fatty tissue. The intra-vesicular cellulo-fibrous tissue remained normal, or rather pale, the fat-cellules being very hyperæmic, and sometimes having their surface covered with minute ecchymoses. The fat contained in the vesicles remained unchanged. This lesion was sometimes simultaneously observed in all the regions named above; frequently it was only met with at the sole or near the knee, and was always found to be more marked at the sole than in the palm. The fat, situated beneath the aponeurosis, at the palm or sole, remained unchanged, and the subcutaneous, or deep-seated fatty tissue, presented no such appearance. No connection could be traced between this appearance and typhus, scorbutus, dysentery, or congelations. It is an undescribed specific alteration, the pathological value of which has yet to be determined.—*Gazette Médicale*, No. XL.

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16. *On the Identity of the Specific Causes of Typhus and Typhoid Fever.*—Dr. Gibbon read before the Medical Society of London an interesting paper on this subject.

The object of it was to apply certain tests as to the truth of the two forms of continued fever met with in Great Britain. The author looked upon the so-called "relapsing fever" as a remittent or malarious disease—1st, on account of the periodicity of its symptoms; 2dly, from the effect of quinine in promoting its cure. After graphically pointing out the obvious distinctions of the typhous and typhoid varieties of continued fever, Dr. Gibbon contended that the contrast, marked as it was in the course, symptoms, and lesions of the two diseases, would not warrant them in concluding that each distemper had its own peculiar and distinct exciting cause. The futility of inferring a specific difference in the nature or cause of a disease from a diversity in the character of symptoms and lesions was illustrated by the fact that secondary syphilis and scarlatina frequently manifested themselves in different patients by eruptions, symptoms, and anatomical lesions of the most diverse description. The author thought that to some minds presumptive evidence of the non-identity of the two kinds of fever had been derived from the assumed close analogy that their exciting causes have to that of measles, scarlatina, and smallpox. It was argued that because measles and scarlet fever were prior to Dr. Wethering's essay confounded together as one and the same disorder, therefore it was possible, and even probable, that before Dr. Jenner's essay, typhus and typhoid were looked upon as varieties of one disease, whereas they were specifically distinct. This presumption was erroneous, from the fact that the two classes of disease were not exactly analogous in their exciting cause, as they undoubtedly were in their seat, symptoms, and course; for scarlet fever and measles were known only to be propagated by personal infection, whereas continued fever was generated spontaneously as well as by personal infection. The only method of settling this important question is that so ably carried out by Dr. Jenner—*i. e.*, the effect of the exposure of healthy individuals to the typhus and typhoid poisons; and if each is found invariably to generate only its own variety of continued fever and not the other, we must conclude that they are generically distinct. As the causation of continued fever was a matter beset with so many fallacies and difficulties, the author contended that Dr. Jenner's 87 outbreaks of continued fever, containing as they did one notable exception to the theory, were far too few to enable a cautious reasoner to decide against the identity of the two maladies. To apply the test of experiment to the Jen-

nerian doctrine, a great and fair one was narrated as having taken place in the British Civil Hospital at Smyrna in 1855. Early in February of that year, in consequence of the infected state of the hospitals at Scutari, 800 sick and wounded soldiers were sent down from the Crimea to Smyrna. At the time of embarkation none of these men had continued fever, but suffered from diarrhœa, dysentery, frost-bite, &c. In consequence of official mismanagement these men could not be landed from the crowded "transports" until several days after their arrival in the Bay of Smyrna. Typhus of a very virulent type broke out; several men died of it, and on February 17th, 1855, 79 soldiers suffering from it were disembarked. In the spacious wards and well-ventilated corridors of the barracks that had been fitted up as an hospital this fever spread from bed to bed throughout the entire establishment. In every instance in which the Crimean soldiers were affected, the disease assumed the genuine typhus character. In Dr. Gibbon's division, which the medical council, with the hope, vain as it proved, of arresting the spread of the disease, at first set apart for the reception of all fever cases, 84 men passed through the disease during the first three months, only 4 of whom had the typhoid variety of the fever, and these men were attendants, not soldiers, in the Crimean army. The author was credibly informed, both by the military and the civilian medical officers, that in all cases where the soldiers were affected, the disease was of the genuine inoculated typhus character. To attend upon these sick soldiers there sailed from England about the same time, 47 Chatham orderlies, 43 civilian orderlies, 22 female nurses, 7 laundry women, 16 lady nurses, 4 dispensers of medicine, and 25 medical officers. What was the result of the direct exposure of these officers to so genuine an epidemic of typhus? The typhus and typhoid continued fever, as we have them in this country, are unknown to the medical practitioners at Smyrna. The disease they call typhus affects, and is very fatal to young children, and from what I saw of it, it appeared to resemble the infantile remittent of this country. The hospital attendants on their arrival were, I believe, in perfect health; certainly none of them had continued fever. I would submit to this Society that if Jenner's theory be true, every one of these attendants who contracted the disease ought to have had typhus, whereas during the first eight weeks, out of the 47 Chatham orderlies, 22 were attacked with the epidemic. I myself attended three of them; they had the "rose-spot" eruption, the diarrhœa, and other general symptoms which are so characteristic of typhoid fever. Of the 43 civilians, 2 contracted fever, one of whom I know to have had typhoid fever, as well from the symptoms I noted during life, as from the extensive ulceration of Peyer's glands I found in the ilium after death. Of the 22 nurses, 7 were attacked, one of whom I saw during life, and examined after death. She had typhus complicated with meningitis. Of the 4 dispensers of medicine, 3 were attacked with typhoid fever, the diagnosis in all three cases I myself verified. One died, and extensive ulceration of the ilium was found at the post-mortem examination. Of 25 medical officers, one had genuine typhoid fever, which clearly originated by personal infection. The details of some of these cases were published in a medical journal in August, 1855, for the purpose of illustrating the treatment of the complications of continued fever. The author thought this experiment open to fewer sources of error than any he had witnessed in this country. Another test applied to this doctrine of fever was by pointing out that it was inconsistent with other facts and well-established truths. For instance, the fact that while there were some cities, as London, where the two forms of continued fever were equally prevalent, there were other cities, as Dublin and Glasgow, Paris and Vienna, where only one form of disease, typhus or typhoid, was found. Again, this doctrine of non-identity was inconsistent with the fact, that in localities where both forms were met with, the epidemics consisted of each variety of continued fever. Again, were the diseases totally different, the cases in which sequence of the two was immediate ought to have been more commonly met with, for patients with either disease were often together in the same fever wards and hospitals. The author had never witnessed a case in which a convalescent from one disease had contracted the other, and he believed such cases to be exceedingly rare. One such case is recorded by Dr. Peacock, but as no details of the first

fever are given, it being merely stated that it was "regarded as one typhoid," and as it is the only case I have read of, I think little, if any, weight should be attached to it. Dr. Gibbon lastly applied Lord Bacon's test of truth—"Truth is fruitful, but Falsehood is barren"—and contended that while other great medical truths, as the discovery of chloroform, the discrimination between measles and scarlet fever, the recognition of all the varieties of secondary syphilis, &c., had borne immediate and most precious fruit; the doctrine of non-identity in continued fever had as yet produced no good result, not even the segregation of the cases in our fever wards and hospitals. Whatever good had resulted from the labours of Louis, Chomel, Stewart, and Jenner, was due to the recognition of the diseases as varieties of the same, not as different species of disease. The author deprecated hasty generalizations from a few instances, and concluded by remarking, that until the non-identity was clearly and conclusively established, practitioners would do well to look upon the two diseases as their names implied, typhus and typhoid, as varieties of one essential fever.

In the discussion which ensued, it was contended by a majority of the speakers that the distinct characters of typhus and typhoid fever had been clearly proved by the observation of Dr. Jenner. The result had been not only sufficient to aid us in our diagnosis, but also in the treatment of the two diseases. The question in some respects might appear to be still *sub judice*, but all experience tended to the conclusion that the symptoms observed were characteristic of two distinct forms of fever, differing in their nature, their symptoms, their causes, and their treatment.—*Lancet*, May 16, 1857.

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17. *Analysis of Fifty-two Cases of Epilepsy.*—Dr. Sieveking read before the Royal Medical and Chirurgical Society, an analysis of fifty-two cases of epilepsy observed by him.

These 52 cases had occurred exclusively under his observation, and the conclusions were limited to points with reference to which satisfactory evidence could be obtained.

Sex.—24 were females, 46.15 per cent.; 28 were males, 53.84 per cent.

Age.—The following is the distribution of the cases throughout the different periods of life: Under 10 years, 17; from 10 to 20, 19; 20 to 30, 4; 30 to 40, 4; 40 to 50, 7; over 50, 1; or from infancy to the age of 20 years inclusive, 69.23 per cent.; from 21 to 40 years inclusive, 15.38 per cent.; from 41 to 55 years inclusive, 15.38 per cent. Arranged according to sex, we find during the first decennium, 8 males and 9 females; during the second, 12 males and 7 females; during the third, 2 males and 2 females; during the fourth, the same number of each; during the fifth, 2 males and 3 females; during the sixth, 1 female. The male sex during puberty, therefore, seems to exhibit a more marked proclivity to epilepsy than the female; at later periods the ratio returns to the equality shown to prevail during the first ten years of life.

Causes.—Hereditary tendency could be traced only in 6 cases, or 11.1 per cent. A definite cause was assigned by the patient or the patient's friends in 16 cases, or nearly one-third of the whole. Among these, otorrhœa is mentioned twice; fright twice; injury to the head, twice. The cases differ in the relation they bear to the occurrence of the seizure.

Premonitory Symptoms.—The occurrence of an "aura" is a point on which observers have expressed different opinions. Comprising under this term all the premonitory symptoms indicating the approach of a fit, it is noted in 27 out of 52 cases; the most common was a sense of giddiness and impairment of vision; sometimes the patient suffered pain in a definite region of the body, or, though unable to explain the sensation, is aware of some change, from which they know that a paroxysm is about to take place. The sensation was never described as a puff of wind or aura in its verbal sense.

Individual Symptoms.—Headache is a very frequent concomitant of epilepsy. It was observed in 33 out of 52 cases, or 63.42 per cent. The mode of its occurrence varies; the patient either suffers habitually or very frequently from it, and the symptom bears no immediate relation to the paroxysm; or the headache occurs shortly before the fits, so as to usher them in; or again, it

affects the individual after they are over. It was constant or frequent in 36.5 per cent.; it occurred before the fits only in 7.7 per cent.; it occurred after the fits only in 17.3 per cent. Biting the tongue is justly regarded as an important corroborative symptom; but it is by no means uniformly present, nor does it constantly occur in the different paroxysms affecting the same individual. The tongue was bitten in 17 cases, or 32.7 per cent. The urine was tested for albumen in 19 cases, and it was found temporarily present in one, permanently in one. It was also tested for sugar in 14 cases, and this ingredient was not found once—a result which seems irreconcilable with the observations of Dr. Goolden.

Results of Treatment.—The author ventured to express a feeling of scepticism with regard to the positive certainty of any cure of epilepsy. He believed that, in the majority, no organic lesion, in the ordinary anatomical sense of the word, was present in the commencement of the disease, and that, in a large number, none seems to result from the recurrence of the fits. It appears that a diathesis is necessary to its occurrence, and that this may be suppressed or held in check; but whether it may be eradicated is a question which he would not venture to answer in the affirmative. He was satisfied of the power of well-selected remedies in repressing, and often indefinitely postponing, the paroxysm, and he particularly insisted on the importance of dietetic and regimenal treatment. The number of apparent cures was 15, or 28.85 per cent.; in other instances, more or less benefit was obtained. The duration of the disease before treatment is commenced, has an obvious influence over its curability. Eight of the 15 (apparent) cures were wrought in cases that had lasted one year or under, four were of two years' duration, one of three, one of six and one of eight years. The treatment had varied with the nature of the constitutional affection in each case; but he was able to draw this general inference, that the main indications which should guide us, are to remove local irritation by counter-irritants, to promote the healthy action of the secernent organs, and to give a tone to the constitution by vegetable and metallic roborants. The author expressed his belief that there was no specific for epilepsy; the salts of zinc certainly fail to remove it in many cases.

In a postscript he detailed the results of an analysis of the returns of the Registrar-General with reference to sex in deaths from epilepsy during seven years; which gave 6729 males, and 6149 females, or 52.26 of the one sex to 47.73 of the other.

Dr. Webster observed that epilepsy was upon the increase in this country, many more persons dying of it now than formerly. In London the deaths were at the present time double the number of those twelve years ago. Hence it was of the utmost importance to ascertain whether the disease could be cured, and if so, by what means. In the populous towns in Scotland the disease was not one-third as fatal as in England. The frequency and fatality of the disease increased in going south, while insanity prevailed most in the north, being more common in Scotland than in England. Males, on the whole, were more frequently attacked with epilepsy than females. In early life the preponderance was in the female sex; in middle age the disease was about equally divided, and in advanced life it attacked males much more frequently than females. Fright was a very common cause of epilepsy, especially in young and hysterical females. One of the worst cases he had seen was that of a young female who was frightened by seeing a "ghost"—a young man dressed up in a white sheet. He had recently heard of a young lady who was seized with an epileptic fit from paying a visit to the Chamber of Horrors at Madame Tussaud's wax exhibition. Later in life drunkenness and dissipated habits were a frequent cause of epilepsy. The disease, he believed, was more hereditary than Dr. Sieveking's tables would seem to indicate. From the observations of Esquirol and others, and from his own investigations, he believed that a third of the cases might be traced to hereditary tendency. In a report of the New York Asylum it was stated that all the cases of epilepsy admitted during the year were traced to hereditary influence, or to drunkenness in the parents. It was only in the early period of life that he thought treatment would prove beneficial. Much had been said of late about various minerals for the cure of

the disease, but it was now admitted that they had only a temporary reputation, and were no better than the other proposed remedies. Regulation of the diet was of the greatest importance in the treatment. He remembered a case in which the patient ate a hearty supper of bacon, eggs, and greens, which brought on an epileptic attack in the night, and resulted in death within two days. Mental excitement was a not unfrequent cause of attack. In the epileptic department of the Salpetrière he (Dr. Webster) conversed with a celebrated Italian cantatrice, who became so excited on hearing him speak in her native tongue about her native place, that she was attacked with a severe fit.

The President, Sir Charles Locock, said the author had omitted to mention one or two causes which were frequently productive of epilepsy. The first was dentition. Though he did not consider Dr. Ashburner quite justified in carrying his ideas so far as to extract teeth for the cure of epilepsy, he had seen many cases in which, after certain overcrowded teeth had been removed, the epileptic patient had never experienced another attack, though he might have previously had three or four in a day. Every one, moreover, was familiar with the number of instances of infantile epilepsy from dentition. Another very fruitful cause was sexual indulgence, and especially onanism, to which he believed might be attributed the greater frequency of the disease of late years. There was a form of epilepsy to which special notice had not been drawn, and which he had been in the habit of regarding as hysterical epilepsy. It was confined to women, and observed a regularity of return connected with the menstruation. It was as baffling a form of epilepsy as any other. The paroxysms only occurred (except in the case of great mental excitement) at the menstrual period. Having been often baffled in those cases, of which he had seen a considerable number, he had been led within the last twelve months to try a remedy, which had so far answered his expectation that he thought it desirable that it should have a larger trial, by being made known to a larger number of persons. Some years ago he chanced to see a paragraph in the *British and Foreign Medical Review*, giving an account of some experiments that a German had been making with bromide of potassium. He found that by taking ten grain doses three times a day for about a fortnight he became impotent, but upon leaving off the medicine his powers returned; he tried a similar experiment with others, and a similar result was produced. He (the President accordingly thought he would try bromide of potassium in many hysterical cases that he met with unconnected with epilepsy, in which there was a great deal of sexual excitement and disturbance, attended with various distressing symptoms difficult to manage; and he found that from five to ten grains given three times a day had the effect of calming the excitement to a very marked degree. About fourteen months ago he was applied to by the parents of a lady who had had hysterical epilepsy for nine years, and had tried all the remedies that could be thought of by various medical men (himself among the number) without effect. She began to take the bromide of potassium last March twelvemonth, having just passed one of her menstrual periods, in which she had had two attacks. She took ten grains three times a day for three months; then the same doses for a fortnight previous to each menstrual period; and for the last three or four months she had taken them for only a week before menstruation. The result had been that she had not had another attack during the whole of the period. He had tried the remedy in fourteen or fifteen cases, and it had only failed in one, and in that one the patient had fits not only at the times of menstruation, but also in the intervals. In answer to Dr. Webster, the President stated that the patients whom he had treated with bromide of potassium, were all under the age of thirty.—*Med. Times and Gaz.*, May 23, 1857.

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18. *On the Curable Stage of Phthisis.*—Dr. Edward Smith read before the Western Medical and Surgical Society, a paper on this subject. The author having discussed the meaning which should be attached to the term "curable," refuses it for this purpose, "as the arrest of the disease, with the return of all vital functions in every part of the lungs." He then divided the disease into three stages, viz: the pre-tubercular; the tubercular, without destruction of

tissue, and the tubercular, with destruction of tissue, whether to the extent of ordinary softening, or of the formation of a cavity. He first considered the question on the received opinion, that tubercle is the essence and the first stage of the disease, and showed that as tubercle in anything is a substance foreign (originally or otherwise) to the cells in which it is found, in order to effect a cure, it must be removed, and that could be effected only by absorption or expectoration. In reference to absorption, he considered that theoretically it might occur, since normal epithelium is probably absorbed after disintegration, and also various deposits into the air-cells, as from inflammatory or congestive action. To determine this practically was most difficult, since it would be necessary that further depositions should also be prevented, and to find a case exhibiting true arrest of the disease, with absorption of the deposited matter, was of extreme rarity. The author had seen many cases in which the vital capacity had not only not continued to decrease, but had considerably increased. But this might only show that tubercle had been removed, and not necessarily that it had been removed by absorption. As a rule, whether the power of absorption exists or not, the deposit usually continues to increase; and hence, if it do exist, its influence must be counteracted by the continuance of new depositions. On the whole, the author believed that absorption of tubercle in the lung may occur, but is not to be expected. In reference to the expectoration of tubercle, he could not conceive of the existence of a cavity without the expectoration of tubercular matter at some period, since the existence of a cavity implied the reopening of a communication with the bronchus, and the removal of the contained matters. At this period the tubercle would be degenerated and disintegrated, and hence be more readily recognizable; but since the expectoration of it would occur *commonly*, with undoubted signs of the presence of phthisis, its determination would be of great value in only a very small section of cases. The elimination of tubercle in a mass was referred to, and certain masses exhibited which would commonly be called tubercle, but which had been expectorated by a patient having rather the evidences of chronic bronchitis. In order to their expectoration from the air-cells, it was deemed necessary that there should have been an advanced stage of destruction, at least over a small area, since the masses were too large to have passed through the minute termination of a bronchus, as it enters the air-cells. The persistence and progress of the disease, in defiance of these two modes of removal of tubercle, were stated to be due to continuance of deposition, and that at a rate, and in a field more extensive than the elimination. The subject of the *arrest* of phthisis was not discussed, but it was fully admitted that true arrest does often occur, and in summing up the whole question, he was of opinion, that if tubercle is to be considered as the essence, and the first stage of the disease, a cure may occur, but is not to be expected, and cannot be brought about by any procedure which is admitted to have a fixed and known relation to the cure.

The author then discussed the nature of the first, or pre-tubercular stage, and showed that in it there was nothing either theoretically or practically which should render it less curable than other diseases, provided the patient could be placed under circumstances as favourable as are required for the cure of other diseases. The evidence of it were those of lessened action of the air vesicles, without the presence of any abnormal material, viz: short and feeble inspiratory action, feeble vesicular murmur, with slight increase of bronchial sounds; lessened mobility of chest; dulness on clavicle in the degree commonly found in chronic bronchitis, and lessened vital capacity and tidal air; and he stated these evidences to exist, only varied in degree, in all cases of predisposition to phthisis. The only change in these signs effected by the deposition of tubercle is to intensify them, and to add prolonged expiration, wavy respiration, or other signs indicative of local obstruction to the entrance and exit of the air; and hence he regarded it as a question of degree, and of future rapidity of progress. In reference to the diminution of the vital capacity at the earliest moment of deposition of tubercle, he showed that it was inconsistently great in relation to the quantity of tubercle, and must, in great part, be due to some other cause, that other cause being the lessened action of

the air-cells. He did not discuss the whereabouts of the power by which inspiration is effected, but mentioned the conditions on which that act must depend, and as of these he believed that there was no defect in the expansibility of the thoracic walls or of the expiratory act, the defect must be in the permeability or tonicity of some part of the respiratory apparatus, or in the call for air, or in the inspiratory muscular power. He deprecated the continuance of the dispute as to the existence or non-existence of tubercle in doubtful cases, on the ground that if there be a pre-tubercular stage, the disease is still phthisis, and in practice ought to be so regarded. In the immense majority of cases there is no practical difficulty in distinguishing the pre-tubercular from the tubercular stage; for, on the one hand, the lessened action is not so advanced, and on the other, the quantity of tubercular matter gives unmistakable evidence of the presence of a solid material. The period of difficulty is when the lessened action is considerable, and the amount of tubercle very small, a period seldom of long duration.

In reply to various questions, the author admitted that the sole difficulty in affirming the existence of the pre-tubercular stage, was in proving a necessary connection between that state of system which is universally admitted as predisposing to tubercle, and the subsequent occurrence of the tubercle; for if this were done, it would be easy to prove or disprove the correctness of the author's description of that stage, and to admit that this early condition must be regarded as an integral part of the disease. The author insisted upon this connection on the following grounds: 1st. That tubercle, as a morbid material, must have a cause and a period in which the changes which produce it exert their influence. 2d. That it has always been admitted that there is a state of system, and that both original and acquired, in which the occurrence of phthisis may be prognosticated; and since this amount of connection is so constant as to be admitted, it would be a fair deduction that the former was a cause of the latter. The duration of this condition of system may be long or short, often indeed from birth, and commonly for years; but the disease itself after the deposition of tubercle is of the most chronic kind, and hence the long duration of the first or predisposing stage may be at least as long, and even much longer, without lessening the probability of a connection between the two. It would not follow that all persons having the predisposing state of system should subsequently have tubercle in the lung, since they might die before the period had elapsed during which tubercle is commonly deposited, or the predisposition might be lessened by favourable circumstances. Then 3d. The connection between these stages was proved by the identity of the evidence before and after the deposition of tubercle, except such as would be due to the deposit of a solid material and to secondary changes. The essence of these is the lessened vesicular action of the lung, as evidenced by the spirometer, the form of the chest, the chest movements, and the respiratory sounds. At the earliest moment of deposition of tubercle these signs are disproportionately great in reference to the quantity of tubercle, showing that they are not altogether due to the tubercle, and they exist before the deposition of tubercle.

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19. *Diagnosis of Apneumatosis* (*Pulmonary Collapse*).—Dr. Graily Hewitt read before the Medical Society of London a paper on this subject. In the first part of the paper, a brief *résumé* was given of the present state of our knowledge respecting that change in the condition of the lungs, formerly described as "lobular pneumonia," and here alluded to under the designation of *apneumatosis*, and the connection of that change with inflammation of the bronchial mucous membrane. It was shown that the pathological danger, consisting essentially in collapse of the air-cells of certain lobules of the lungs, is observed almost constantly in the lungs of infants and young children dying from bronchial affections. It being a fact, that one-third of the mortality in the second year of life arises from affections in which the bronchial mucous membrane is implicated, the importance of diagnosticating the presence of what may be considered the fatal element in these affections—apneumatosis, was quite evident. The effects produced on the system generally by the supervention of this condition, involving, as it must do, a serious diminution in the

degree of the respiration, were then briefly described. The *general* symptoms observed in particular cases, so far as they are diagnostic of the presence of apneumatosis, were then considered. Children of weakly constitutions are particularly liable to be attacked with that form of bronchitis in which, as a sequence, apneumatosis takes place. In such cases the febrile stage of the bronchitis is of brief duration, and a state of prostration soon ensues, characterized as follows: The skin becomes pallid, or dull and shrivelled; its temperature sinks. The dyspnœa is aggravated, but altered in character; the breathing is very shallow; the rhythm of the movements "expiratory," very little air entering the chest at each inspiration. The pulse is very weak; the eyes half closed; the lips blue; the cough is extremely feeble. This is a typical description of the symptoms in cases where apneumatosis has followed bronchitis; but many modifications of these are observed in different cases. The shallowness of the respiration, the peculiar kind of dyspnœa, and the pallidity of the skin, were considered as diagnostic signs of great value. There was a great resemblance afforded by the condition just described and that of the cold-blooded animals, the respiration, physiologically considered, being in both cases small in amount. The congenital condition described by Jörg as *atelectasis* differed from apneumatosis, inasmuch as the latter change occurred after birth, and affected portions of lung which had once been properly aërated although the two conditions otherwise resembled each other. The differential diagnosis of atelectasis and apneumatosis would be based on a consideration of the history of the case in question.

The diagnostic data derived from a *physical examination* of the chest next formed matter for deliberation. The diagnosis of a chest affection in early life, the physical signs alone being considered, was shown to be by no means easy. By *inspection* of the chest in cases of apneumatosis, the ribs at their junction with the cartilages, and the cartilages themselves, are observed to be drawn in during inspiration; the lung does not expand, and the descent of the diaphragm produces a falling in of the thoracic walls at their parts which are the most yielding. At a point two inches below and outside the nipple, the walls most readily give way to atmospheric pressure. The antero-posterior diameter of the chest is then increased, the transverse diameter diminished. Retraction of the chest walls is in conjunction with certain symptoms, of value in a diagnostic point of view. It is not observed to so great an extent when emphysema to a notable degree exists, a circumstance which is not uncommon. *Percussion* gives occasionally information of great value, although the irregular manner in which the apneumatic portions are scattered over the surface of the lobes renders it often difficult to establish the existence of a marked degree of dulness. *Auscultation* shows absence of respiratory murmur when the portions of lung affected are of considerable extent. There is generally heard, however, a rhonchus, which has a somewhat grating character. Rhonchi more or less fine are also usually discoverable, but the fine crepitus of true pneumonia is not heard. The respiratory murmur is often bronchial in character over the affected portions. The absence of continued and persistent heat of skin, as well as of the true pneumonic crepitus, distinguishes cases of apneumatosis from cases of *pneumonia*, in addition to which the rarity of this latter affection in early life affords evidence of a presumptive nature against its being present in a particular case. The history of the case will in most instances be sufficient to distinguish apneumatosis from *tuberculization of the lungs*. The remarks now offered as to the diagnosis of apneumatosis were to be regarded as suggestive only, a larger experience being necessary in order to do more than indicate the general principles on which the diagnosis in question is to be arrived at. The chief points alluded to in the paper were illustrated by means of drawings of the lungs of patients who had been under the author's observation during life.—*Lancet*, March 28, 1857.

20. *Rupture of the Heart.*—Dr. O'Ferrall exhibited to the Pathological Society of Dublin (Feb. 7, 1857), a drawing and preparation illustrative of a variety of rupture of the heart, which, in his opinion, has not been before described. The lesion consisted in fatty degeneration of the anterior coronary

artery; rupture of one of its branches; injection of the cellular tissue, forming a clot round the vessels and nerves; and, finally, rupture of the serous covering of the heart.

The case was that of a man fifty-five years of age. His friends stated that for the last two years he looked pale; but his habits of exercise continued uninterrupted until two days before his death. At this time, not feeling so well as usual, he stayed in bed, and took some aperient medicine. On the day of his death he was lying in bed, at about 10 o'clock in the morning, talking cheerfully with his friends; soon after his breathing was remarked to become frequent; he, however, made no complaints, nor did he mention anything of his sensations to his friends. The dyspnœa rapidly increased, and at length (almost suffocated) he started up in the bed, his face flushed, and his eyes having a staring expression. He cried out, "Take me out of bed!" "Put a blister on my chest!" "Open the windows!" And after other expressions of distress the pallor of death overspread his features; he was lifted back into bed, and in a few minutes expired.

On opening the body after death, and slitting up the pericardium, a rent two inches long was perceived on the anterior and upper surface of the heart, along the line of the septum. The edges of the rent were separated about half an inch, and between them projected a firm clot, the upper and lower portion of which were the colour of dark venous blood; the middle had the appearance of fibrin. The heart was then carefully removed for further examination. On opening the cavities the right auricle and ventricle were found overdistended with dark fluid blood; the left cavities were perfectly empty. There was no communication whatever between any of the cavities and the ruptured surface of the heart. The substance of the heart itself presented the tawny colour of what is termed fatty degeneration, and was so soft as to be lacerated by the slightest force. A probe passed into the anterior coronary artery, went down through the clot, and showed that the trunk of the vessel was intact. Very careful dissection demonstrated one of its branches ruptured, and presenting an open mouth in the middle of the clot; the texture of the artery and its branches was so brittle, that the slightest force broke them down. The aorta was remarkably thin, friable, and presenting a layer of steatomatous matter beneath its lining membrane. The valves were all perfectly healthy. There was no blood in the pericardium, but there was about two ounces of serum, which had scarcely a sanguineous tinge. Dr. O'Ferrall said that various forms of rupture of the heart had been described, viz: perforating rupture; interstitial rupture (or the "cardiac apoplexy" of Cruveilhier); and rupture of aneurism of the coronary artery. The case now presented exhibits the rupture of a *branch* of the coronary artery, without any previous aneurismal formation; and caused by the peculiar degeneration of the coats of the vessels which, when occurring in the brain—as described by Mr. Paget—occasionally gives rise to apoplexy. All these ruptures of the heart appear to be connected with one common lesion, that degeneration which has been called fatty, but which he would prefer terming lardaceous or oleaginous degeneration, in order to leave the term "fatty heart" for that condition which consists in a deposit of fat on the *surface* of the heart, and which he had sometimes found in combination with a considerable degree of firmness of the muscular fibre beneath it.

The Dublin School has done much in elucidating this subject. Dr. Robert Adams took an early and efficient share in this inquiry, and since that time Professors Smith and Stokes have enlarged the sphere of our knowledge. The manner in which it destroys life was well explained by the specimen before the society, when taken in connection with the history of the brief struggle which preceded death. A heart weakened by oleaginous degeneration, and performing its functions feebly, becomes suddenly embarrassed by the pressure of a coagulum upon the vessels and nerves supplying its right side; thus a partial paralysis of the right side of the heart is produced; and these cavities contracting feebly or not at all upon their contents, become over distended with blood, as was found in this case. This condition may be supposed to be connected with the symptoms of suffocation, and suffusion of the face, which

marked its first stage. The right side of the heart ceasing to propel the blood, the systemic vessels must of course become gorged; and the countenance most probably, at that moment, indicated this condition. The dyspnœa is easily explained. Then comes the secondary consequence of this over-distension of the right side, viz: the want of arterial supply into the *left* side of the heart. The left side of the heart not receiving its usual quantity of blood, the brain must consequently cease to have *its* necessary supply; and here comes the explanation of the sudden pallor and death by syncope.

It is probable that the hemorrhage took place so slowly as to allow a coagulum to form before the serous membrane gave way, and this circumstance, together with the fact of the hemorrhage having occurred from a small branch, would account for the absence of coloured blood in the pericardium. Dr. Robert Adams, in the *Dublin Hospital Reports*, has alluded to this paralysis as a consequence of deficient supply through ossified or calcareous coronary arteries. It is probable that in the present case the pressure of the clot upon the vessels and nerves occasioned a deficient supply, both of nervous influence and arterial blood, to the right side of the heart. The present case is therefore remarkable as explaining, by its morbid anatomy, the brief series of phenomena that occurred before death; and as adding one more variety of rupture of the heart to those already described.—*Dublin Hospital Gazette*, April 1, 1857.

21. *Diabetes and Saccharine Conditions of the Urine.*—Dr. A. B. Garrod concludes the Gulstonia lectures before the Royal College of Physicians which, this year, were delivered by him with the following summary of the effects of treatment.—

"To sum up in a few words my opinion of the effects of treatment in diabetes, I may remark, that I consider attention to *diet* of the utmost importance; and, without this, I believe that other means are almost, if not entirely useless. In certain stages of the disease, the diet is advantageous in proportion to its freedom from amylaceous or saccharine matters; the nearer it can be obtained free from these, the greater is the benefit likely to accrue to the patient. The nitrogenized matters should not be excessive in quantity, at the same time that due allowance must be made for the inability of the patient to assimilate amylaceous principles. In consequence of the appetite being generally above the healthy standard, and also to prevent the disgust which a rich animal diet is apt to produce, it is most desirable to introduce certain non-nutritive materials into the diet, which give bulk to the aliment, satisfy the hunger, and, at the same time, make the azotized and fatty matters more palatable and acceptable to the patient. To effect this, I know of nothing equal to the bran bread I have shown you to-day. In addition to the bran or gluten bread, I consider that certain green vegetables, as water-cress, greens, and lettuces, may be advantageously allowed in small quantities; as a diet quite free from vegetables, if continued for any length of time, will inevitably lead to the production of scorbutic symptoms.

The liquid portion of the diet should also be kept as low as possible; and diabetic patients often derive much comfort from holding small pieces of ice in their mouths, instead of drinking copious draughts of water. The washing out of the mouth, also, with cold water sometimes effects the same object. Alcoholic liquors should be used sparingly; perhaps the best is a little good bitter ale, or small quantities of pale brandy freely diluted.

With regard to the administration of drugs, I believe that in many cases but little advantage is derived from them; if, however, the nervous system is irritable, small quantities of opium may be useful; if there is any anæmia, iron preparations, as the metallic iron in the form of the *fer reduit*, or the ammonio-citrate or phosphate of iron should be administered; and if the skin remains harsh, ammonia salts in small doses, combined or not with other remedies, as the warm bath. If the emaciation be great, or phthisis threaten, cod liver may likewise be used; for, although I have shown you that these drugs, when given in large doses, and for a limited period only, produce no sensible diminution of the saccharine secretion, yet we may regard it as a fact, that everything which leads to an improvement in the health, by removing any

other abnormal state that may be present, tends, in the long run, to ameliorate the diabetic condition; hence great advantage is derived from change of air and scenery, relaxation from business, and other such hygienic means, especially the avoiding of cold east winds, the use of the flesh-brush, and warm clothing. I have said that in certain cases I believed that weak alkaline drinks, as the Vichy waters, or alkalies given in other forms, are occasionally of advantage, especially if the functions of the liver be disturbed, or any amount of irritation of the stomach be present."—*British Med. Journ.*, May 16, 1857.

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22. *On the Prevention of Constipation.*—Prof. PHŒBUS, of Giessen, refers habitual constipation to the following causes, which may either act separately or in combination:—

1. The too spare employment of articles of diet which promote the action of the bowels. Among these water is to be placed in the first rank. Either from its not being of convenient access, or its quality being bad, this drink is taken by many in insufficient quantity. In sedentary occupations the sensation of thirst is too seldom excited, and the habitual frequency of such sensation may become much diminished if the satisfaction of the call be neglected. To this class of aliments also belong fruits, salads, sour milk, honey, and fat. Many country people, who sell all their produce, eat little of these things except salad; and the poorer inhabitants of towns often get them only in insufficient quantity. Those persons who can procure them usually eat salads and fats in too small quantities; sour milk easily excites diarrhœa, fruits may cause flatulence, and honey is not always obtainable good. 2. Too little bodily exercise. 3. Want of exercise of the powers of the large intestine. This is the most influential of all the causes. It is an error to suppose that the power of the will extends only over the sphincter; for it prevails much higher, only it requires considerably more time for its exertion. Several minutes, or a quarter of an hour, may be required to initiate the evacuatory movement, and the uninitiated may fail altogether in the attempt. By exercising it, we increase the disposition of the intestine to act, but, under any circumstances, this is rarely the case in less than five minutes. By paying attention we may plainly feel the intestinal movement, and convince ourselves that it is independent of the action of the abdominal muscles: for although the action of these muscles gives the first impulse to the movement, they contribute little or nothing to its progress.

Numerous are the remedies which have been recommended for constipation; but the action of medicinal substances in so chronic an affection may easily become prejudicial; and especially such as exert a chemical or functional action, such as the salts or drastics. In the great majority of cases no other means are required than those indicated by the above-mentioned causes. The commonest of these is the want of exercise in the large intestine. If a stool is desired, the patient must earnestly practise the necessary gymnastic, which consists in alternate movements of the rectum as during actual evacuation, and in rapidly drawing in and then expanding the abdominal muscles. Such movements may be commenced in the chamber and completed in the closet, several minutes, a quarter of an hour, or even more, being required. If evacuation has commenced, but has not proved productive enough, the movements must be continued, the person making a firm resolution not to quit the closet until the aim has been completely attained. The movements are, in fact, the same as those normally employed; but they are more rapid, and continued for a longer time. Kneading and rubbing the abdomen, recommended by some, are also useful, but as a general rule they are quite unnecessary; and may be reserved for those who are not able to follow the above directions, such as children, insensible persons, &c.

As a general rule, an adult should compel a stool every day; and the author does not agree with the statement that some individuals may be content with fewer, believing that such constipation often aggravates morbid conditions. In from four to eight weeks, and without the necessity of observing the same hour, a complete mastery may be acquired over the intestine, so that a stool

may be always secured once in the twenty-four hours. Although this is the most powerful agency in overcoming habitual constipation, and will succeed alone, yet it acts more efficiently when conjoined with articles of diet favourable to an open state of the bowels. A larger quantity of water will be more easily drank if at first carbonic acid gas be added. An adult, during winter, should take from sixty to eighty ounces daily (deducting from this the equivalent of any artificial drinks he may take), a larger quantity still during great bodily exertion, and from one and a half to twice the quantity in summer. When raw fruit gives rise to flatulence, it may be taken cooked with spices, and especially when dried and cooked. With greater regularity of stools, also, flatulence becomes less, the food being retained for a less time within the canal. Other articles of diet, as salads and fat, should also be taken in moderation. Exercise, whether on horseback or foot, if continued, is of great service; but it exerts no sudden effect, and at first may even induce constipation.

Trying the plan upon himself when a student, the author has, during his twenty-eight years of practice, recommended it to an immense number of persons, and in the great majority of cases with complete success. For himself he has attained the power of procuring a daily stool at any convenient time between four o'clock A. M., and mid-day, the average time required being a quarter of an hour. Only on one occasion during thirty years has he failed in his object. Where it fails it is from the want of the necessary strength of purpose. The plan is not so suitable for the aged; and is inapplicable to women during advanced pregnancy, or in organic disease or prolapsus of the uterus. When from insufficient perseverance the means does not succeed, cold water clysters form the best supplement; and, exceptionally, salt and oil, with chamomile tea, &c., may be thrown up. The author never gives purgatives by the mouth in chronic constipation, believing it to be most impolitic to irritate the stomach and small intestine, disturbing chylopoesis, and introducing into the blood materials that are always more or less injurious.—*Med. Times and Gaz.*, May 23, 1857, from *Präg Viertaljahr*, Bd. lii.

23. *Lactic Acid a Remedy for Dyspepsia.*—A remedy which has for a long time been used by Dr. NELSON, of Birmingham, and subsequently by many French physicians, under the name of Pepsine, for the cure of dyspepsia and other functional derangements of the stomach, has within a short time been prescribed freely by some physicians in London. It has been very favourably noticed by Drs. Ballard and Sieveking. Dr. O'Connor has also tested its value in those cases in which it has been recommended, but not with the success attributed to its use. He was led subsequently to have recourse to lactic acid, a remedy which he believed likely to be more beneficial in those affections of the stomach in which the so-called pepsine has been administered. Before using the acid internally, Dr. O'Connor, we understand, in order to test its digestive powers as compared with pepsine, placed an equal weight of animal fibre, in equal proportions of pepsine and lactic acid, in separate vessels, in an equal temperature, when he found that the fibre in the lactic acid was reduced to a pulpy state in a very much smaller space of time than that which was put into the pepsine. After this experiment, which he thought sufficiently conclusive of the superiority of the lactic acid as a promoter of digestion, he had recourse to its use as a remedy in those affections of the stomach before alluded to. The great number of patients with affections of the stomach presenting themselves among the out-patients of the Royal Free Hospital, afforded an extensive field to Dr. O'Connor for testing the efficacy of lactic acid in dyspeptic conditions. After a trial in over fifty cases, he considers that the good results following its use fully justify him in recommending it as a valuable agent. It is very necessary to be sure that the lactic acid prescribed should be of chemical purity, and of uniform strength. The dose varies from half a drachm to two drachms or more, in infusion of colomba, or a little cinnamon-water. It should be taken during a meal. The lactic acid found in shops is not generally pure; that which Dr. O'Connor has found to be most efficient, from its greater purity, is prepared by Mr. Bastick, of Brook Street, Grosvenor Square.—*Med. Times and Gaz.*, April 25, 1857.

24. *Creasote in Erysipelas.*—Dr. Delarue strongly recommends the following application in erysipelas, which he believes exerts even a specific effect upon the disease: *Creasote* 8 *parts, lard* 30 *parts, to be applied to the parts every two hours.—Med. Times and Gaz.*, April 4, 1857.

25. *Iodide of Ammonium.*—Dr. B. W. Richardson has been using this article with considerable success. It is soluble in water, and not unpleasant to the taste, differing from the iodide of potassium in being a little more pungent. The dose for an adult is from one to three grains.

Dr. Richardson has, at this time, prescribed the iodide of ammonium in thirty-eight cases, including one of secondary syphilis, four of chronic rheumatism, six of phthisis pulmonalis in the primary stage, and in a variety of forms of strumous disorder attended with glandular enlargements. In action, the iodide of ammonium is in many respects analogous to the iodide of potassium, but its effects are more rapidly evidenced. It seems in some instances to produce diuresis, and its influence in the reduction of glandular swellings is exceedingly well marked and satisfactory.

The iodide of ammonium admits also of external application as a liniment, with glycerine or soap liniment as the menstruum. Thus applied, it is easily absorbed. In two cases of enlargement of the tonsils, both of old standing, and in one of which, the patient being a child, several unsuccessful attempts had been made at extirpation, Dr. Richardson prescribed half a drachm of the iodide dissolved in an ounce of glycerine, and ordered the solution to be freely applied every night over the tonsils with a large camel's-hair brush. The application in these cases has now been continued for nearly two months. In the child, the tonsils, which originally were so large that they impeded swallowing, and excited a constant cough, have now become reduced nearly to their normal dimensions, and the symptoms have disappeared. The other case occurred in private practice, but the results, we have learned, are equally successful.—*Lancet*, May 2, 1857.

26. *Liquor Sodæ Chlorinatæ as a Local Application in Smallpox.*—Mr. John Gabb states (*British Med. Journ.*, Ap. 4, 1857) that he has found a weak solution of the liquor sodæ chlorinatæ highly beneficial in the affection of the mouth and throat in cases of smallpox. In each case in which he has employed it, the effect has been extraordinary; one washing of the mouth and gargling of the throat has restored the patient to comfort and ability to speak or swallow without difficulty. The strength he has used has been a drachm to half a pint of water. Applied to the skin, it has had the effect of allaying the troublesome itching; and he thinks it not unlikely that a much stronger solution, applied in the earlier stage of the eruption, might be as efficient in preventing pitting as some other remedies which have been recommended, whilst, at the same time, it could be more easily used.

Finding the solution so useful in allaying the itching of smallpox, I gave an old woman, aged 86, who had been for more than twelve months tormented with pruritus, and had tried various remedies without effect, the same to use as a lotion. In a few days she came for more, and said she had never used anything that gave her so much relief.

27. *Fumigations of Essence of Turpentine in Itch.*—Dr. A. Anselmier extols this mode of treatment proposed by M. Aube. The patient, on going to bed, sprinkles on the sheets and the clothes he is wearing thirteen drachms of essence of turpentine. When he awakes, he is said to be cured. His bed and clothes are freed from the infection, and the odour of the turpentine is lost in two or three days.

28. *Progressive Fatty Degeneration and Atrophy of the Voluntary Muscles.*—Mr. Leggatt read before the Western Medical and Surgical Society an interesting paper on this subject. He commenced by alluding to the various monographs and papers hitherto published on the subject, especially that in the *Archives Générales de Médecine* (1850), which contains the history of several

cases, partial and general. Dr. Moore (*Dublin Medical Journal*, 1852), who published a similar paper. He then passed on to Dr. R. Quain's long note appended to his paper on Fatty Degeneration of the Heart (*Med.-Chir. Transactions*, 1850), in which several cases are mentioned in which this disease occurred. He then passed on to the paper on this subject by Dr. Meryon, which appeared in *Med.-Chir. Transactions*, 1852. Many cases are there recorded, but the records of the two post-mortem examinations, in both of which the nervous centres were found perfectly healthy, though the voluntary muscles of the upper and lower extremities were observed in various stages of fatty degeneration. The only symptom observed had been loss of power, commencing in the lower extremity. Cruveilhier noticed the same disease in *Arch. Gén. de Méd.*, 1853. In all the cases examined the nervous centres were healthy, but in two the anterior roots of the spinal nerves were greatly atrophied, especially in the cervical region. Hence he considered the disease to be essentially dependent on this cause; that the disease is in fact paralysis, and that the atrophy and degeneration of the muscles are secondary consequences only. Another case was quoted (*Brit. and For. Med.-Chir. Review*, Oct. 1855), in which the disease was evidently dependent upon chronic arachnitis of the cord, originating in a fall; in this case, too, the anterior roots of the spinal nerves were inflamed, softened, and atrophied.

In his own case his observation of it had extended over above ten years. The subject of it was male, born in the country, of healthy parents, in 1838, and removed to London in 1840. When first seen by the author he was strong, vigorous, and healthy, but in the summer of 1845 he had jaundice, measles, and remittent fever, the latter severely. After his recovery he became weak in his lower extremities, and fell frequently in walking. In 1847 he was seen by Sir B. Brodie, who considered the case as some spinal affection. In 1850 Sir B. Brodie recognized the disease as similar to Dr. Meryon's case alluded to. The symptoms were loss of power in the lower extremities, some wasting of the muscles of the thighs, those of the calves remaining firm and large. The treatment was essentially tonic, with galvanism. No benefit occurred, the muscular weakness increased, and gradually extended itself to the upper extremities. The muscles of the face, of deglutition and articulation, were not affected, nor was the sensibility of the skin. The rectum and bladder were unaffected, except that during 1849 there was slight incontinence of urine. His faculties were unimpaired, and his general health was good. He died from pneumonia in 1856, aged 18. A careful examination was made 28 hours after death, during which the muscular system generally was found to be wasted, and the lower limbs much emaciated. The spinal cord was softened about its middle one-third, but not inflamed. The roots of the spinal nerves were healthy, and so was the brain, and all the different viscera, except the right lung at its base, where it was softened. In the cervical and dorsal regions of the back the muscles were healthy, in the lumbar pale; the intercostals were thin, and the diaphragm very pale. By the microscope no inflammatory alteration could be detected in the cord or its membranes, but it showed fatty degeneration in its various stages in the pale muscular structures, and in some of these fibrous degeneration without fat. In the heart much of the striated appearance of health was absent, and much of its structure was undergoing granular and fatty degeneration.

The author then analyzed fifteen cases of this disease, and stated the results thus—With respect to the brain: in 6 the brain was healthy; in 1 the white substance was softened; in 1 there was an osseous plate in the arachnoid. With respect to the chord: in 6 it was healthy; in 1 partially softened without fatty degeneration; in 4 the anterior roots of the nerves were not observed; in 1 they were inflamed, softened, and atrophied, the cord also being inflamed and softened; in 1 they were normal, while the cord was softened, but not inflamed. He thus considered that the disease in question was not of spinal origin, in his own case being persuaded that the softening of the cord was only of recent origin, and not the cause of the paralysis. He also regarded it premature to advance M. Cruveilhier's theory, that it consisted in atrophy of the spinal nerves at their roots; but rather viewed the disease as dependent

upon depraved nutrition of the muscular system generally. In addition to wasting and want of power, M. Cruveilhier had described among the symptoms pain, twitchings, and cramps; these are described in no other paper. In all, the general health was good, and the command of the sphincters complete. The prognosis as to progress and to recovery was always unfavourable. The treatment, of course, was tonic, with the use of galvanism. The author then, in conclusion, enumerated the causes, and grouped them thus: 1. Excessive muscular action and fatigue. 2. Severe illness, and utter exhausting influences. 3. Hereditary tendency (?) This seemed established in Dr. Meryon's and M. Aran's cases; though, in the present instance, the author could not trace this as a cause.

In the conversation which followed, Mr. Brodhurst mentioned a family in which four out of nine members have been similarly affected: of these two had died and two survived; of the latter, one had head symptoms; of the former, in one the brain was softened after death, the cord not being examined; of the others, one died from apoplexy, one from phthisis, and one from hydrocephalus.

Dr. Fuller related three cases in its partial form, affecting the back of the neck, and the right upper extremity (two cases) respectively.—*Med. Times and Gaz.*, March 21, 1857.

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29. *On the Pathology of the Articular Cartilages.* — A paper by Thomas Bryant, Esq., on this subject, was read before the Royal Medical and Chirurgical Society (March 10, 1857). The author commenced by briefly describing the method by which cartilages are nourished, and laid stress upon the point of their dependence upon the integrity of other structures for their supply of blood; the consequence of this dependence being well shown in the fact, that the nutrition of the cartilages is necessarily arrested or perverted upon any disturbance to the nutrition of the part, upon the integrity of which they depend for their nourishment. The diseases to which the cartilages are liable were described, as hypertrophy, atrophy, and granular, fatty, and fibrous degeneration. That hypertrophy might exist under the same circumstances that induce such a result in other tissues could not be denied, although the author knew of no genuine case. The cases described as such were associated with other disease of the joint, and it was questioned whether such a thickening was not the result of softening, or mere swelling of the tissue, or some other pathological change. That atrophy of cartilage exists, daily experience gave positive evidence, occurring either in old or young people, where any of the requirements for healthy nutrition were defective. Under the head of granular degeneration, was included the majority of cases of what is called ulceration of cartilage. The author adverted to the investigations of Professor Redfern, stating that his own researches had but tended to convince him of the truth of that writer's conclusions. He then described the microscopical appearances of cartilage in the various stages of its degeneration, and stated that the degeneration might primarily commence either in the cartilage itself, or upon its synovial or bony surfaces; in the latter cases, the degeneration being only secondary in the order of events, some diseased or perverted nutritive change in the bony lamella, or synovial membrane, being antecedent to the degeneration of the cartilage. A case was then given, illustrative of the dependence of the cartilages for their integrity upon the integrity of those tissues to which they were connected. It described a small patch of the synovial surface of a cartilage having become degenerate, exactly corresponding to a patch of inflamed synovial membrane, the other portions of the cartilage being quite healthy. If this membrane had been ruptured, an ulcer, so called, would have been visible. The analogy between this process of degeneration and of ulceration generally was then alluded to, and the author asked if it were not fair to conclude that the same cause—namely, inflammation, which we know does produce a normal nutrition in a part, would in other tissues be also followed by the same series of changes, and that granular degeneration of the cell structure, whatever that structure may be, is the element of the process which is called ulceration? Degeneration of cartilage as depending upon

disease of the bony lamella or heads of the bone was then mentioned, and the different appearances of the cartilage in the different stages of the disease were then described. Fatty degeneration next claimed attention, and was described as being constantly found in joints which had been deprived of their natural function by any cause whatever. The general and microscopical appearances were then given, and a case illustrative of the subject read. The author then stated that it was due to this form of degeneration that the rapid disorganization of a joint follows upon an accidental attack of inflammation in chronic diseased joints. Fibrous degeneration was next described, and the different appearances to the eye and the microscope in its different stages. The connection between this form of degeneration and the calcareous degeneration of the osseous lamella was mentioned, and also the connection between the fibrous and granular degenerations, the former appearing to be a more chronic change of a somewhat similar character. Other changes were then alluded to, not included in the preceding divisions, such as the deposition of gouty materials in and upon the cartilages of joints, and the absorption of cartilage, leaving the porcellanous or dense bony surface of the osseous lamella. A case was then read illustrating the connection between the bony lamella and the cartilage, and demonstrating that the degeneration of the latter and the calcareous degeneration of the former were produced by similar causes.—*Med. Times and Gaz.*, March 21, 1857.

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30. *Unusual and Obstinate Form of Swelling.*—Mr. J. L. Milton records (*Edinburgh Med. Journ.*, May, 1857) the following remarkable and perhaps unique example of swelling, with which he himself had been afflicted.

"After having long suffered from eczema of the scalp, I was attacked, early in June, 1855, with colicky pains of the most severe description, which only yielded to the inhalation of chloroform. To this succeeded a general outbreak of eczema, accompanied by neuralgia of the right side of the face, chiefly confined to the track of the posterior dental branches of the superior maxillary nerve, and the whole of the inferior dental. Quinine, steel, croton oil, and counter-irritation having failed, probably from want of proper perseverance, chloroform was again resorted to, and, during the succeeding fortnight, was frequently inhaled several times in a day. It relieved the pain, but left, as might have been expected, considerable disturbance of the stomach, and confusion of ideas, perception, etc. On one occasion, chloroform containing camphor was inhaled, which was followed by free vomiting. Large doses of quinine, with croton oil and galbanum pill, removed any further traces of the neuralgia; and, at the suggestion of a friend, I went to reside in a healthy part of Kent, and commenced a course of mild aperients and tonics for the eczema, which had all this time remained very bad.

"By the middle of September it had somewhat abated, and my general health was greatly improved. I was advised not to take arsenic; and, in order to procure temporary relief from the discharge and pruritus occasioned by the eczema, I had two or three times applied strong astringent lotions, containing a large amount of hydrocyanic acid and zinc, without noticing any effect beyond smarting and arrest of the secretion.

"Just about this time, then (the middle of September), I noticed one morning, when dressing, a large swelling extending from the inner to the outer side of the thigh, running just below Poupart's ligament. It was of the colour of the skin, firm and painless, of a pyriform shape, the broad end being at the inner side of the thigh, over which it extended full three inches. I was alarmed, but, on undressing at night, found that it had disappeared. The next morning, on rising, an unusual sense of stiffness was felt along the upper part of the left hip. Remembering the phenomenon of the previous day, I examined in the glass, and was astonished to see a large swelling stretching backwards just below the crest of the ilium. This time it was red, but painless as before. It was five or six inches in length, about two in breadth, and raised a full half inch above the surrounding skin, the margin being clearly defined. This was quite a new state of things to me, and I watched its progress with no little anxiety and interest.

"The third day, the left extremity of this swelling had become indistinct, and the other end began to stretch down the left side of the sacrum; but, after a short interval, it took another direction, and on the fourth day there was a fully formed lump creeping along the crest of the right ilium: it extended but little more than half way round when it began to lessen, and passed gradually away. Meantime, a smaller swelling formed over the middle and upper part of the left thigh, which disappeared in the same way as the others.

"For upwards of three weeks, one or two of these swellings formed every day about the hips, crest of the ilium, and upper part of the left thigh; the right thigh not being attacked. Sometimes two occurred almost simultaneously; on one day there were three. In every instance, they appeared in the same manner and over the same track as those first described, being only more isolated. From this time they diminished in frequency, and became more dispersed.

"Towards the end of October, the face was attacked. A hard swelling passed slowly over both eyes, beginning outside the external angle of the right eye, and subsiding considerably there before it reached the corresponding point of the left eye. It ran its course in about eight hours, and then slowly subsided, but considerable puffiness remained for several days. Each eye, in succession, was so firmly closed at the height of the attack, that not a ray of light could be perceived, even when an attempt was made to open the eyelid forcibly with the fingers. A few days after, the mouth was assailed, the swelling being much more prominent. One or two swellings also showed themselves on the legs, and one or two small ones on the arms. There was now generally an interval of a day or two between them; and after a few irregular outbreaks, the disorder almost entirely quitted the lower part of the frame to appear with concentrated violence in the face.

"Here, after three attacks, the disorder fairly reached its climax on the 11th of December. About 4 A. M., a swelling commenced with a peculiar sensation of tension and uneasiness in the left cheek, which soon roused me, and prevented further sleep. On grasping it with the hand, it felt like a large walnut. It spread with the most surprising rapidity, and by eight o'clock had reached right across the lower part of the face, which was so swollen as to be visible like a dark projecting shadow on casting down the eyes. The anterior surface of the upper lip was protruded horizontally outwards, and firmly pressed against the nostrils; the mucous membrane of the lips was shining, and so tense as to feel as if it would crack. All attempts at articulation were very imperfect, and though the mouth was not firmly closed, yet nothing could be swallowed, owing to its rigidity and the total loss of control over the movements of the lips. The swelling was quite defined, ceasing above on a level with the nostrils, and inferiorly about an inch below the mouth. The margin rose abruptly from the surrounding skin, and it lay like an oblong tumour across the face. Thus it remained till early the next morning, when both eyes were for the first time attacked at once; in a short time I became totally blind, and remained so for some hours.

"The photograph exhibited to the Society represents the last and smallest of the swellings on the face; it was taken an hour and forty minutes after I first noticed the peculiar sensation of stiffness. This time the swelling was confined to the lower lip. I regret much that the figure of some of the larger ones was not preserved, but the blindness and difficulty of speaking rendered me averse to leaving my room.

"Three times the throat was affected, and here the swelling reached its maximum in half an hour. Mr. Wallford, a medical friend whose aid I requested in one of these attacks, said that the posterior fauces presented much the same appearance as in a bad case of cynanche; the uvula, soft palate, and tonsils being greatly swollen. Saliva was poured out in large quantities, and for some hours the sense of suffocation was almost unbearable, owing probably to the epiglottis being involved.

"From the 11th of December the number and severity of the attacks steadily declined, and they finally disappeared on the 14th of March, 1856.

"At no time were these swellings painful, even on firm pressure, to which,

I may here observe, they did not yield. Some of them conveyed a feeling of heat to the hand, but, in general, the only sensation remarked was an extreme stiffness and distension. The skin was, for the most part, unaltered in colour, though some of the lumps on the arms and legs were of a pale pink, and one or two on the hip of a bright red. The subsidence of the swelling was never followed by any desquamation or itching, but on two occasions the skin of the lower part of the face became slightly yellow, and there was a free secretion of sebaceous matter, which, for some days after, could be peeled off in flakes.

"No constitutional disturbance of any kind accompanied either the outbreak or decline of these singular phenomena; nor did they seem to bear any relation to such aggravation or improvement as occasionally took place in the eczema. I never succeeded in tracing them to the use of any particular article of food, though I must plead guilty to an immoderate indulgence in strong coffee for some years previous. When once the swellings had begun to form, no local application, such as vapour baths, hot fomentations, poultices, cold spirituous lotions, and pressure, exerted the slightest influence in checking their progress. Mr. Gay and Mr. Skey were consulted. Both recommended tonics; and these certainly improved the general health, and possibly, also, controlled the severity of the symptoms. Mr. Robert Taylor kindly examined the urine, but found it quite normal; he, however, advised colchicum and bichloride of mercury, which seemed to hasten the disappearance of the disorder, thus suggesting some analogy with chronic urticaria. Sir Benjamin Brodie considered the affection dependent on disorder of the stomach, remediable by the use of liquor potassæ. Diaphoretics were tried, as the skin was always dry; but I cannot say that I ever noticed any appreciable effect from their employment.

"None of these swellings ever formed in the afternoon or evening. All those of which I noticed the commencement began between four and ten A. M., and, with one exception, always reached their utmost height in four hours. Those on the face were generally about a week in subsiding completely; the others disappeared almost as rapidly as they came.

"I have thus endeavoured to give a faithful description of the case while it was yet fresh in my memory, and would gladly learn if any light can be thrown on the pathology and history of the complaint.

"In the beginning of January last, these swellings again made their appearance in as severe a form as ever, but this time confined entirely to the trunk. Iodide of potassium, in doses of seven grains, three times a day; a grain and a half of the acetic extract of colchicum every night, followed by one-eighth of a grain of bichloride of mercury, also at night, removed them. This time also they supervened upon the use of dilute nitric acid, taken in moderate quantities for about a month previous to the appearance of the first tumour."

SURGICAL PATHOLOGY AND THERAPEUTICS, AND OPERATIVE SURGERY.

31. *Concussion of the Spinal Cord.*—Dr. J. S. Hughes makes some interesting remarks (*Dublin Hospital Gazette*, April 15, 1857) on this subject, and adduces the following example of the accident:—

"L. Whelan, æt. 40, a strong, healthy drayman, was admitted into Jervis-street Hospital on the 15th February, 1857.

"*History of the Case.*—Whilst endeavouring to jump up on his dray, which was in rapid motion at the time, Whelan toppled over, coming to the ground on the back of his neck with great violence; he was immediately lifted up by the bystanders, and conveyed on a car to the hospital, as it was found that he had no power whatever over his legs. On examination after his reception into hospital, the following symptoms evinced themselves, viz: There was complete loss of motion, as well as of sensation, over both of his lower extremities, but

he possessed perfect command over his bladder, having made water, of his own accord, soon after his admission; intellectual faculties unimpaired; pulse weak and quick; temperature of the legs and feet very low; no vomiting. A slight degree of swelling and redness existed at the seat of injury, corresponding to the fourth, fifth, and sixth cervical vertebræ; but no evidence of fracture of the vertebræ could be detected. After the patient had been for about an hour in bed, he began gradually to acquire some feeling in his lower extremities, together with a return of the power of motion; but according as he regained the motive power over his lower extremities, loss of power of motion, but not of sensation, over his hands and forearms as gradually set in. In four hours after admission into hospital he had the perfect use of his lower extremities, but had completely lost the control over his forearms and hands.

"*Treatment.*—Absolute rest in the recumbent posture enjoined. One dozen leeches were applied to the seat of injury, and two grains of calomel, together with one-quarter of a grain of opium, were ordered to be given every fourth hour.

"20*th*. Symptoms as before; mouth unaffected by the mercury. Continue the pills, and take 12 ozs. of blood, by cupping, from the back of the neck.

"23*d*. The patient now enjoys more power over his left hand and arm, but his right hand and forearm continue powerless; mouth slightly under the influence of mercury; but he has, during the night, been attacked with mercurial diarrhœa. Omit the pills; give chalk mixture and catechu, and rub half a drachm of mercurial ointment, night and morning, into the axillæ; apply a blister to the back of the neck, and dress the surface afterwards with Albespeyre's issue paper (No. 2).

"*March* 4*th*. Power over left hand and forearm improved, but the right hand and forearm remain almost perfectly paralyzed; mouth slightly affected. Ordered half a grain of the sesqui-iodide of mercury, in the form of pill, three times in the day. Electro-galvanism was directed to be applied, daily, from the region of the neck to the right hand and fingers, beginning at a low power, and gradually increasing it in strength.

"12*th*. A progressive amendment has taken place since last report. The patient has regained complete power over his left hand, and is daily regaining the use of his right one. The electro-galvanism has been applied each day, as directed. The iodide of mercury was withdrawn this day, mercurial fetor and insalivation being present.

"*April* 2*d*. The patient is now so far improved, that he can tightly grasp a small object with both his hands, and he feels so well, in every respect, that he is anxious to return home, but has been prevailed on to remain in hospital for a few days longer.

"*Remarks.*—Concussion of the spinal cord, independent of fracture or luxation of the vertebræ, may present varieties, both as to the extent, intensity, and duration of its symptoms; thus it may give rise to but a partial and transient impairment of the powers of motion or sensation, or of both, to parts below the seat of injury; it may be followed by complete and permanent destruction of motive power, and of sensation, of either one or more of the extremities; or it may, on the other hand, when affecting the cord above the origin of the respiratory nerves, prove instantaneously fatal. Sometimes, in concussion of the spinal cord, death ensues at a remote period, from bed-sores and sloughing; at other times, the patient is carried off by chronic inflammation of the bladder and kidneys.

"Concussion of the spinal cord, independent of fracture or luxation of the vertebræ, is not unfrequently accompanied by more or less compression of the spinal cord, the consequence of either effusion of blood, or of lymph, or of both (which was probably the case in the man at present in the hospital) a point of importance, with a view to the treatment of these injuries.

"The loss of power, in a case of concussion of the spinal cord, will, to a great extent, depend on the part of the cord injured. Thus, for instance, in the case of Whelan, at present under our observation, in which the violence was applied to the region of the neck, but below the origin of the respiratory nerves, the patient was immediately affected with loss of power and sensation

over the lower extremities, and, soon afterwards, by paralysis of his forearms and hands; but it is an interesting fact, and one of course much in his favour, that he never lost control over his urinary bladder.

"About two years ago, we had, as many of you no doubt recollect, a Prussian sailor, Kramoset by name, under our care in this hospital, who, having on a long voyage at sea fallen in a gale of wind from the main-yard arm of his ship to the deck on his back, was instantly seized by paralysis and loss of sensation of the lower extremities, as well as by loss of power over his bladder. In the Prussian's case, the injury was chiefly confined to the lumbar portion of the spine, where he was struck, in his fall, by a projecting part of the deck. Whether in his case there had been a fracture of one of the vertebræ, was a matter of speculation, there being apparently the *slightest possible* projection of one of the lumbar spinous processes. We kept the poor fellow for some months in the hospital, at the expiration of which time we sent him to his own country, through means of the Prussian consul, having regained perfect power over his urinary bladder, and somewhat improved in his other symptoms, but not materially so, with a view to his ultimate recovery.

"It is very important to hold in mind, that a severe shock communicated to the spinal column, may be followed by symptoms very different indeed from those of concussion or compression of the spinal cord, in proof of which I need only mention that, about two years or so ago, I was asked by Dr. Kavanagh, junior, of Kingstown, to see a sailor boy, with him, who had fallen on his head and spine to the deck, from a temporary gallery, which had been erected round the funnel of a steamship, and who, as the result of the accident, was, at the time I visited him in consultation, labouring under all the well-marked symptoms of cerebro-spinal arachnitis.

"As to the diagnosis of concussion of the spinal cord, *lesions of motion or of sensation, or of both, to a greater or less extent, and for a longer or shorter period, over one or more of the extremities, supervening instantaneously on shocks communicated to the spinal column, are the symptoms that are characteristic of concussion of the spinal cord; and where these are completely absent, true concussion of the spinal cord does not, according to the modern acceptation of the term, exist.* Myelitis, or spinal arachnitis, which are very different in their symptoms, and which may result from violence inflicted on the spinal column, must, therefore, not be mistaken for concussion of the spinal cord.

"Now, with regard to the pathology of concussion of the spinal cord, when opportunities have been afforded of examining the medulla spinalis, immediately, or soon after the receipt of the injury, a highly vascular state of the cord has been detected; in some cases the cord exhibiting, on division, a somewhat reddish hue; in others assuming a yellowish or preternaturally white appearance; whilst in others again, apoplectic clots have been found in the substance, or on the surface of the cord; whereas, in many of the instances on record, no morbid appearances whatever presented themselves to the eye either in or about the spinal cord or its membranes. Thus, Frank mentions four cases of concussion of the spine, in not one of which could any morbid appearance be detected, either in the vertebræ or in or on the spinal cord.

"We cannot be too cautious in delivering our prognosis in a case of concussion of the spinal cord, inasmuch as it is by no means at all easy to foretell in what manner a case is likely to terminate; but we should, as a general rule, be chiefly guided in forming our opinion as to the likely results, by the following considerations, viz: the seat of injury, the extent of nervous lesion, and the condition of the urinary bladder. The most unpromising cases do, however, sometimes recover. A man may, on the other hand, apparently completely recover from the results of concussion of the spinal cord, and yet, after a longer or shorter lapse of time, become the subject of ramollissement of the medulla spinalis, as a remote consequence of the injury.

"The chief indications in the treatment of a case of concussion of the spinal cord are, absolute rest in the horizontal position; the use of the catheter, when necessary; depletion, general or local, according to circumstances; the administration of mercury, so as to bring the system rapidly under its influence;

the avoidance of bed-sores; and the application of electro-galvanism, should such be deemed requisite.

"Absolute rest, in the recumbent position, is best carried out in injuries of the spinal column, by the use of one of Earle's beds, by which means the patient need not abandon the horizontal position, or move his spine, even during the action of the bowels.

"With regard to the exhibition of mercury in concussion of the spinal cord, many prefer calomel; others the iodides. In Whelan's case, we kept up the mercurial action for some days, by the administration of half-grain doses of the sesqui-iodide of mercury, as it has the character of rapidly rousing the absorbents in removing extravasated blood, or lymph, or both, when effused.

"In concussion of the spinal cord, counter-irritation frequently proves useful; and electro-galvanism may, if used at the proper period, as in Whelan's case, act most beneficially.

"Bed-sores, which are with much difficulty kept off in concussion of the spinal cord, where there is persistent paralysis of the lower extremities, are best avoided by the use of suitable pillows, air-cushions, or the water-bed; or by placing the patient on partially inflated ox-bladders. When bed-sores threaten, the surface should be painted over with solutions of gun-cotton or gutta percha in chloroform or ether.

"In conclusion, it is scarcely necessary to say, that the greatest attention should be paid to the condition of the urinary bladder, in all cases of concussion of the spinal cord; and that, if necessary, the urine should be drawn off by means of a catheter, as often as may be required."

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32. *The Constitutional Origin and Treatment of Cancer.*—Mr. Weeden Cooke presented to the Harveian Society (Feb. 19, 1857) a valuable and instructive paper on this subject.

The author had begun the study and treatment of this disease at the Cancer Hospital on the principle of local eradication by operation, but some years of observation upon upwards of a thousand cases have gradually forced upon him the conviction, that the whole system must be the first, as it is the most difficult point of attack—the local disease being comparatively easy of management. As to hereditary predisposition, Velpeau says 1 in 3 have this predisposition. At the Cancer Hospital it has only been noted in 1 in 6, and by Lebert in 1 in 12 cases. This forms at least a link in the chain of evidence. According to a calculation made by Mr. Cooke, in upwards of 1,000 cases, the average age is 43¼ years. At the Cancer Hospital the female patients are 6 to 1 male. The effect of depressing moral agents has been noted by most authors, but rejected by some. Sir A. Cooper says, "Three-fourths of these cases arise from grief and anxiety of mind;" and the author's experience confirms this opinion. Material alterations in the blood are brought about under these circumstances. Atrophy of the red corpuscles and increase of the colourless globules may be observed, and thus the creative power of the blood is deteriorated, and the tissues which this ill-elaborated fluid forms shows that defective organization which is seen in cancer. Whether the defect be a process of exudation or of impaired nutrition is a speculation difficult of solution, but Mr. Cooke leans to the idea of deranged nutrition or degeneration of the tissues, similar to the fatty degeneration now so fully recognized. In a very large number of cases there is a period when the cancerous tumor ceases to increase, begins to diminish and gradually to waste away, so that the prolongation of life is not in any way affected by the patient having been subject to this malady. The spontaneous cure of the disease has been noticed by Velpeau as well as Sir A. Cooper and other authors; and several cases were recited from among the patients at the Cancer Hospital. Of all the medicaments which experience or theory has shown to influence this disease, iron, in its various forms, is capable of effecting the largest amount of benefit. In order to obtain this good in various constitutions it is necessary to vary the form of its administration, and then to alternate this tonic with others. The mineral acids are most valuable, either alone or in combination with other drugs. Lemon-juice and sarsaparilla, in delicate people, is a most excellent appetizer. Bark, in the

form of the compound tincture, is largely used with the greatest benefit at the Cancer Hospital; and cod-liver oil as an adjuvant to the other remedies is serviceable. Diet and moral management are of the utmost moment in the conduct of these cases. The system requires to be well nourished, and somewhat stimulated. Good meat, good beer, and a fair supply of good vegetables, putting aside the nonsense of sloppy soups and leucophlegmatic fish, to waste the appetite and distend the stomach; and wine may be taken according to advice. The treatment of the mind is not less important, and if we could eradicate the idea of the incurability of cancer we should do much towards its cure. Hope would assist our efforts at restoration more perhaps than any physical agent. The diversion of the mind from the contemplation of the malady by the influence of genial society, by the cultivation of literature and science, and by change of scene in travel, have tended to the production of that atrophy of the disease which is in fact its cure. As to the local treatment of cancerous tumors, it appears from the statistics at the Cancer Hospital that 128 persons have presented themselves who had been operated on previous to coming to the hospital, and that the average lapse of time before the return of the disease in these cases was eighteen months. From this it may be assumed with tolerable justice that operations do not generally cure the disease. There are, however, some cases in which removal of the local malady is desirable, as tending to prolong life or remove unsightliness. One is, that of the advanced hemorrhagic stage of cancer, and the other condition is when epithelial cancer attacks any exposed part, such as the lips, face, or extremities. The method of removal in either of these cases should be by the knife, under the influence of chloroform. As to the revival of the treatment by caustics, says Mr. W. Cooke, "now that we have the invaluable assistance of chloroform, I cannot imagine how such a necessarily prolonged and painful procedure can be recommended by the profession, or tolerated by any patient who has the power to select the least of two evils. The knife can do without pain in as many minutes all that the caustic can do with pain of no ordinary character in as many days." These two agents, however, in the local treatment of cancer, are of infinitely less importance than those which assist in the induction of that atrophy of the tumor which nature brings about in many cases, and which art may assist in promoting in many more. Of all the detergent remedies, lead, in its various pharmacopœial forms, is the most efficacious. The liquor plumbi, alone or diluted; the ceratum plumbi and the ceratum saponis, which contains lead; the unguentum plumbi iodidi, and the emplastrum plumbi, with or without soap or adhesive plaster, are all, at different stages of the disease, most valuable adjuvants to the general constitutional treatment. It would be tiresome to enter into details of special applications for particular parts of the system, such as the chlorate of potash and hydrochloric acid lotion, and carrot poultice to the ulcerated or sloughing breast; the borax lotion, and the application of the nitric acid or sulphate of copper to the tongue, &c. These are matters which practice teaches, and which may sometimes perhaps be varied with advantage according to the taste or fancy of the surgeon, provided that the great principle be at all times kept in view, namely, that local treatment in cancer, whether by the knife or caustic, or detergent applications, is and must be second in importance to the general upholding of the constitutional powers.—*Med. Times and Gaz.*, April 4, 1857.

33. *Necrosis of Cancer and its Consequent Enucleation.*—M. Moullin read a paper on this subject before the Medical Society of London (April 25, 1857). We notice the paper principally on account of the sentiments which the discussion of it called forth, and which we believe to be eminently sound. Mr. M. premised by giving the history of six cases of cancer of the breast, and showing several specimens which had been enucleated by the action of the chloride of zinc. These specimens, the author stated, were positive proof of the result of a mode of proceeding which, as far as he could ascertain, was entirely new. The object proposed was not to destroy tumours piecemeal, making layer after layer slough and separate by successive applications, which are each brought into contact with an extremely irritated surface, but rather to

cause the slow death of the morbid growth, by causing its substance to become day by day penetrated more and more deeply by an agent which coagulates the blood in its vessels, and acts in like manner upon the living albuminous solid; and finally, when completely necrosed, to become enucleated *en masse*, as in the present instances. The principle which guides the whole proceeding is one well known and acted upon by all our best practitioners. It is to proportion the rate of our therapeutic efforts to that of the disease we are dealing with. In acute disease we must act with energy and rapidity; in chronic, with sustained gentle perseverance. The morbid action that would be exasperated by violent measures, yields kindly to a mild influence steadily maintained. Such, the author believed, was the rationale of the treatment which he fully described in the history of the cases. Mr. Moullin stated that the essential point in his plan of proceeding was the mode in which the remedy was used, and it was quite possible that other remedies used in the same way might produce like effect, of which we have repeated instances in medicine. The great step, however, was to gain the leading idea, the guiding principle; details are easily learned by experience. The history of these cases furnishes us with a very good illustration of the disease in its various stages, as is seen in the out-patients' room of our metropolitan hospitals daily. No. 6, of one year's duration, was in its first and by far the most favourable stage for either plan of treatment, being about the size of a nut, perfectly movable, and rarely causing much pain. The disease, the author thought, at this stage might, with all propriety, be denominated local. No. 1, of twelve years' standing, was a very good example of the disease in its second stage; the tumour the size of an ordinary orange, of stony hardness, well defined, yet movable; pain more of a lancinating character, as if a needle were run in. Next come Cases 3 and 4, the one of two, the other of twelve years' growth, where the tumour is attached to the integuments, having that peculiar appearance previous to the commencement of ulceration, and forming the third stage. Then Cases 2 and 5, the one of twenty, the other of three years' duration, where ulceration takes place, presenting an open excavated sore, with hardened, everted, irregular edges, uneven base, covered with a gray slough, offensive, thin discharge, frequent losses of blood, and all the usual train of constitutional symptoms. Such was the history of the cases brought before the society, and it was in such cases that the plan of treatment proposed would be found most advantageous. The object of this plan of treatment is not merely to destroy diseased parts, but to modify the abnormal vitality of the subjacent tissues, without which the disease will reappear. The effect of the chloride of zinc in cancerous cases has long been known to the profession, and largely used on the continent, with marked success, and in this country by Mr. Ure, who, in 1836, brought before the profession the treatment of cancer by the chloride of zinc. He says: I have no doubt that a part of its efficacy in eradicating from their ultimate ramifications cancerous tumours, is to be ascribed in no small degree to the powerful action it exercises on albumen. In this way, numerous minute points, undiscoverable by the surgeon, and inaccessible to his knife, are searched out and destroyed; for when the chloride of zinc comes in contact with the morbid albumen, it gradually penetrates its substance, so as to deprive it of vitality, and to form an eschar. Without seeking to draw a comparison between the relative merits of the extirpation of cancer by surgical operation and by the necrosing agent in question, suffice it to say, that the latter never creates any serious inconvenience, while an amputation of the breast may not always have the most favourable issue. The chloride of zinc is found most useful in open or ulcerated cancers and cancroid growths generally, where the knife is utterly out of the question, also in the enucleation of tumours that are of a doubtful nature, and in secondary cancerous formations that take place after operations with the knife. In the treatment of rodent ulcer, the *noli me tangere* of some authors, of which Mr. Moullin related a case (cured by him in eight weeks) of seven years' duration, which had resisted various other plans of treatment, the author stated that two important questions presented themselves for the consideration of the profession. The first is, the possibility of the enucleation of tumours, malignant or benign, by the action of chloride of zinc. This first point, he

thought, was satisfactorily proved by placing facts before his professional brethren, and he would leave it to them to declare whether they were satisfied with the result. As to the second point, viz., the liability and probability of a return of disease after enucleation of the tumour, this nothing but time and experience could decide.

Dr. MACKENZIE remarked that the paper could not decide the respective value of the local treatment of cancer by enucleation or the knife, inasmuch as the cases related were too recent on which to form any opinion. It was still a question how far the removal of the local disease did away with the chances of return. Cases had constantly occurred in which the removal of the local disease was followed by internal cancerous affections, and had destroyed the patients. He related a case in point.

Mr. BARWELL said that it was questionable whether any local treatment would so modify the constitutional taint as to prevent a recurrence of the disease. He was surprised that there had been so little pain in Mr. Moullin's cases. In 1824, M. Cancoin had used the arsenical paste in some cases with a fatal result. He then experimented with seventeen different kinds of escharotics, and had found that of these nitric acid was the least painful in its application, whilst chloride of zinc was the fourteenth on the list. He (Mr. Barwell) had used the tannic acid in some cases of cancer. To be of service, it was necessary that there should be much care in its application. Slits must be made in the slough to enable the tannic acid to permeate through it. Applied in this way it was productive of little pain.

Mr. JABEZ HOGG did not feel satisfied with the evidence produced by the author as to the character of the tumours which had been enucleated by him. In the absence of a microscopic examination, the diagnosis must necessarily be imperfect. Numbers of cases were called cancer, treated as such, and said to be cured, which were in reality benign tumours. He related a case which had been sent up to him from the country, of supposed cancer of the tongue. The disease, however, was found to be caused by pressure from decayed teeth. The teeth were removed, and tannic acid, under the advice of Mr. Barwell, applied to the so-called cancer, which was perfectly cured in a fortnight.

Mr. BIRKETT had been quite disappointed in the paper, which contained nothing new. Escharotics had been extensively employed, to prevent the natural alarm which patients had on the use of the knife. With respect to true cancer, no case had been recorded as successful after removal, which was not eventually followed by death from secondary deposits in some other organs. It was said in favour of escharotics that they had so much influence on the surrounding tissues as to prevent the recurrence of the disease, but this was a mere assertion, and had not a tittle of proof to rest upon. The question at issue was clearly "caustic *versus* knife;" and he contended, in opposition to the statement of the employers of caustic, that the knife was not uncertain, but that the local disease could be more safely and readily extirpated by it than by caustic. He had tried the caustic; it had been also extensively used by Key, Callaway, and Brodie. Mr. Key had tried it in fifteen or twenty cases. All the cases had terminated with exactly the same results as if the knife had been used. M. Cancoin had operated in four cases in this country, and he (Mr. Birkett) was in a condition to state the ultimate results of these proceedings. The first case was that of a lady thirty years of age, who had been operated upon three times by Sir Benjamin Brodie, and twice or thrice by Mr. Turner, of Manchester. The case was afterwards treated by M. Cancoin, and did not recur. But it was well known that this was not a case of cancer at all, but was simply one of adenocele. It was reported, however, at the time as a case of cancer, and vaunted as a cure of that disease. The other three cases terminated fatally, just as though the ordinary operation by the knife had been performed. The cases recorded by M. Cancoin in his work might be divided into four distinct classes: 1, cases of chronic abscess; 2, cases of ordinary adenocele; 3, cases of irritable mamma. These, of course, all did well. The 4th were cases of true cancer, all of which had an unsatisfactory termination. He (Mr. Birkett) contended that the use of the caustic had no advantage whatever over that of the knife, and he called upon the author of the paper to state explicitly what

was the real influence which the caustic exerted over the tissues surrounding the primary growth, so as to prevent a recurrence of the disease.

Dr. ROGERS had seen a case which had been operated upon in the Middlesex Hospital by Dr. Fell. The patient had died, after three weeks of agonizing torture, from carcinomatous disease of the chest, and effusion. He had seen a similar case of cancer of the os uteri, but with the same results, under the care of Dr. Pattison. This patient had died after the most intense agony, consequent upon the application of the caustic.

Mr. WEEDEN COOKE believed that the author's plan of slicing and cauterizing a cancerous breast was identical with that pursued by Dr. Fell. It was a most painful and severe operation, protracted for thirty or forty days; and, after all this suffering, did no more than the knife could do in a few minutes, without any pain at all, with the aid of chloroform. The plan pursued by Mr. Stanley, at St. Bartholomew's Hospital, was a much more humane and equally efficacious proceeding; but in Mr. Cooke's opinion, excision by the knife, if an operation was necessary at all, was the only proceeding that ought to be sanctioned by the profession. Mr. Cooke, however, considered that operations, whether by caustic or the scalpel, were undesirable; that the disease was not eradicated by them, but that the dyscrasia which accompanied the disease was thereby increased, and life shortened. On the other hand, by supporting diet and tonic treatment, the constitution was enabled to resist the progress of the disease, and bring about that resolution by atrophy of the tumour which was observed in so many cases at the Cancer Hospital. Mr. Cooke thought that the whole profession would eventually protest against this revival of a treatment, painful in the extreme, and having no single advantage over the usual mode of excision by the knife.—*Lancet*, May 2, 1857.

34. *Subclavian Aneurism Cured by Displacing a Portion of its Fibrinous Contents.*—In our number for January last, p. 256, we noticed an ingenious method proposed by Mr. Fergusson for the treatment of aneurism. This consists in displacing a portion of the fibrinous contents of the sac, and directing them so as to obstruct the dental end of the tumour.

Mr. ROBERT LITTLE records (*Med. Times and Gaz.*, May 23) the following interesting case of subclavian aneurism treated by this plan.

D. M., an albino, aged 53, admitted into the County Donegal Infirmary on the 6th October, 1855, with an aneurism of the right subclavian artery, gives the following history of his case: States that, having been in the habit of dealing in eggs and fish, which he usually carried through the country in a basket suspended on his back by means of straw ropes through which he passed his arms, he first felt pain in the right arm in the preceding month of March, which gradually became so severe that in the month of May he was frequently obliged to sit down on the roadside and remove his burden for a time. Soon afterwards he discovered a tumour above the right clavicle, directly corresponding to the site on which one of the ropes pressed, which also became painful after a short time; and in the beginning of July he perceived "a beating in the lump," which then began to enlarge rapidly. In the month of August he says he had such a feeling of drowsiness that for a fortnight he slept the greater part of each day and night, during which time he lost his appetite and took nothing but milk, and at this time he was unable to bend his fingers. Sleep then suddenly deserted him, and he declares that for a fortnight prior to his admission into the Infirmary he did not sleep a single hour, owing to the intensity of the pain in the tumour and along the arm.

Symptoms on Admission.—A tumour equal in size to the largest goose egg occupies nearly the entire of the supra-clavicular region, extending from the clavicular attachment of the sterno-cleido-mastoid to the acromial end of clavicle, which has a strong pulsatory movement that is visible from the most remote part of the ward, and is accompanied with a loud *bruit de soufflet;* it is soft and compressible; and is red and somewhat inflamed on the surface, from which circumstances Doctor Greer, under whose notice the patient first came, greatly feared the aneurism would have burst. There is no appreciable dulness on percussion under right clavicle, but the respiratory murmur is not as distinct

as on the opposite side; however, this may arise from its being somewhat masked by the loud bruit on that side; the superficial veins of head and neck are considerably enlarged, but he does not suffer either from cough, dyspnœa or dysphagia; tongue tolerably clean, pulse at wrist 80, and regular; appetite not good. His chief source of complaint is a severe and constant pain extending from the tumour down the right arm as far as the tips of the fingers, which he says is most acute about the middle of the humerus, and he is constantly compressing this part with the other hand, conceiving that it gives him some relief. At first he got sedatives, had cold applied to the aneurism, and each night had a full anodyne, which treatment somewhat moderated the violence of the pulsation, and made him feel more comfortable, and after a few nights, when the anodyne had been considerably increased, he got some tranquil rest.

In December he was bled twice from the arm, and ice was kept constantly applied over the tumour for three weeks, without any manifest improvement, except that the redness and inflammatory appearance of the integument covering the aneurism have completely disappeared; in other respects, the symptoms remain unaltered. Having seen the report of Mr. Fergusson's very interesting case, I resolved to follow his suggestion in this apparently hopeless one, and I must confess I did so without any very sanguine expectation of success. Accordingly, on the 1st of January, 1856, by making gentle but steady pressure with my thumbs alternately over the aneurismal sac, I succeeded in displacing some of the coagula, and directing them towards the distal end of the artery. No other local treatment was adopted, but he was ordered the persesquinitrate of iron internally. For the first two days no change was perceptible in either the tumour or the arm; but at the third day the pulse at the wrist was manifestly weaker, and the arm somewhat colder than the opposite one. These symptoms gradually increased up to the tenth day after the manipulation of the sac, when no pulsation could be felt in either radial, brachial, or axillary arteries. The tumour itself had now become more solid, and the bruit and pulsation were both diminished; the violent pain in the tumour and along the arm has also decreased, but now he complains of a sensation of coldness over the right shoulder and scapula, and of a severe pain extending along the side of the neck and back of the head, which increased in severity for a month, and the arm became greatly wasted, and partially paralyzed, retaining very little sensation and scarcely any power of motion.

March. All pulsation in the aneurism having now ceased to be visible, pressure was applied over it.

November. Both bruit and pulsation have completely disappeared; the aneurism is not more than one-third its original size, and is quite solid; the anterior edge of clavicle feels thin and sharp, from the absorption of its upper surface, caused by the pressure of the sac, and the pain alongside of head and neck, heretofore so much complained of, has completely subsided. The arm has regained its natural temperature, and, although still considerably attenuated, he can use it tolerably well, sensation having also returned to it. A very slight pulsatory wave can now be felt in the radial artery, but not in either brachial or axillary. Two superficial arterial branches, of considerable magnitude, can also be traced, running in a transverse direction across the remains of the aneurism, one immediately above the clavicle, the other somewhat higher up.

March, 1857.—Having again admitted the patient into the Infirmary within the last few days, for the purpose of examining his condition, the absorption of the tumour is steadily progressing, being now not larger than a walnut. Pulse at the wrist somewhat stronger than at last report, but still not to be felt in either brachial or axillary. Sensation and motion are completely restored to the arm. He is free from all pain, and says he feels perfectly well, and intends resuming his former occupation. I may mention that most of my medical brethren in this locality having taken a deep interest in this case, and visited him from time to time while under treatment, have also seen him since his last visit to the Infirmary, and agree with me in considering the cure to be most satisfactory and complete.

35. *Ligature of Arteries in Suppurating Wounds.*—In one of his recent clinical lectures, M. Nélaton made the following observations, the occasion being a secondary hemorrhage in the palm of the hand. Nothing is more difficult, he observed, than to arrest a hemorrhage of the hand, especially when this is consecutive—that is, when the wound is covered by pyogenic granulations. If not previously instructed as to the proper management of these secondary hemorrhages, you will be extremely embarrassed. The blood flows, you employ compression, and it ceases; but the hemorrhage will not be long before it returns, and will then be uninfluenced by compression. If compression be made above the wound, œdema takes place in all the subjacent parts, and the hemorrhage soon returns. The radial, or the ulnar, or the brachial may be tied, and yet the bleeding does not stop. Meeting such a case, M. Nélaton formerly was quite at a loss to know what to do, impressed as he was with Dupuytren's *dictum*, that arteries in a suppurating wound will not bear the ligature, the premature fall of this infallibly giving rise to a return of the hemorrhage. Nevertheless, he ventured to tie the two ends of the bleeding vessel of the palmar arch; and although the ligature fell sooner than usual, no hemorrhage followed. He has frequently since then tied vessels under analogous circumstances, and has never seen hemorrhage as a result of the fall of the ligature. Although, therefore, this fall takes place earlier (usually about the third or fourth day) than is the case with a ligature applied to a healthy artery, it is not premature, for bleeding does not follow. Examining the matter experimentally upon the dead body, M. Nélaton has found that ligatures applied to arteries in a state of suppuration (as in patients who have died after amputation) produce identically the same effects upon the coats of these vessels as upon arteries remote from the seat of inflammation; the same division of the inner coats and preservation of the outer taking place in the two cases. He feels, therefore, perfect confidence in the soundness of the practice, supported as it is by numerous cases that have occurred to him, both in private and hospital practice.—*B. and F. Med.-Chirurg. Rev.*, April, 1857, from *Gaz. des Hôpitaux*, 1857. No. 1.

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36. *Forcible Extension and Rupture of the Uniting Medium of Partially Anchylosed Surfaces.*—Mr. Brodhurst read before the Royal Medical and Chirurgical Society (March 24, 1857) an interesting paper on this subject. He commenced by stating that excision of the articular surfaces of bones is at the present time an operation of frequent occurrence, and that it is undertaken not as a substitute merely for amputation, but that this operation is performed in cases where amputation would not be thought of, and where forcible rupture of partially anchylosed surfaces would be advantageously had recourse to. He related three cases of partial anchylosis of the knee, in which the adhesions were ruptured, and motion was restored. He also cited three similar cases in which the articular extremities of the bones were excised, and related four cases of partial anchylosis of the hip, and one case of partial anchylosis of the elbow; in all of which rupture of the uniting membrane was successfully performed. The author then gave a brief historical sketch of the operation, to show the means which have been hitherto adopted in the treatment of these cases, and to contrast them with those which he has practised, and which he recommends; and concluded with some details as to the after-treatment adopted by himself. The cases related were—

1. A youth, aged 14, with partial anchylosis of the knee at a right angle, together with sub-luxation of the tibia backwards, of nine years' duration.
2. A female, aged 42, with angular false anchylosis of the knee, together with sub-luxation of the tibia backwards, of ten years' duration.
3. A female, aged 17, with angular false anchylosis of the knee, which had existed one year.
4. A female, aged 8, with angular false anchylosis of the hip-joint, of three years' duration.
5. A female, aged 13, with false anchylosis of the hip, of four months' duration.

6. An artillery officer, aged 25, with false anchylosis of the hip-joint, of fourteen months' duration.

7. A gentleman, aged 21, with partial anchylosis of the hip-joint, of twelve years' duration.

8. A boy, aged 8, with angular false anchylosis of the right elbow, of five years' duration.

The author stated that in no instance did inflammation occur; and also that in all these cases motion was obtained. In some, complete power of motion in from six weeks to three months; in others, less extended motion. He concluded that fibrous adhesions may safely be ruptured when they have formed between articular surfaces. And he recommended that when muscular retraction exists, and there is much rigidity present, the tendons should first be divided, and subsequently the adhesions should be ruptured, when the punctures have healed.

Mr. URE said that Professor Langenbeck laid great stress upon the reduction of the tonic contraction of the muscles by chloroform, rarely resorting to subcutaneous section, except in the cases to which Mr. Brodhurst has referred where fasciæ or cicatrices interfered. In his memoir, Langenbeck mentioned six cases of anchylosis overcome by his method, five of the knee-joint, and one of the hip-joint—the ages varying from 4 or 5 to 35 years. In some cases, the patients walked about in a fortnight or three weeks after the rupture by alternate flexion and extension of the diseased articulations. Very little after-treatment was found necessary, simply a small dose of morphia, and occasionally iced applications; in one or two cases leeches were applied, and venesection was resorted to in one instance. He (Mr. Ure) had adopted Langenbeck's plan in the case of a little girl in St. Mary's Hospital, who suffered from contraction of the knee-joint, and a great improvement was the result.

Mr. HENRY LEE said the author had described the advantage of subcutaneous section of the tendons and fasciæ in cases of partial anchylosis. In those cases there must be some effusion of matter, more or less solid, into the joint; and where that was the case, it must be apparent, if the ligaments were left entire, that any forcible extension of the joint must not only lacerate, but occasionally bruise and crush the ligaments. The surfaces of the articular cartilage must be altered in their outline; so that it might be impossible for a semi-anchylosed joint, even if the adhesions were free, to be moved. In cases where inflammation affected the ligaments without any alteration of the articular cartilages, it was often impossible fully to extend or flex the joint, on account of the alteration that had taken place in the ligaments. He wished to ask Mr. Brodhurst whether he had tried the plan of dividing the ligaments. It appeared to him (Mr. Lee) that if the ligaments could be subcutaneously divided, the joint might be extended with much less force and injury to the parts, and very much less chance of inflammation. It might be said that there would be a chance of opening the joint; but if that were so, the opening of a joint under such altered circumstances would be nothing in comparison to the opening of a sound joint.

Mr. CHARLES HAWKINS asked the author whether the cases he had enumerated included all that he had met with in his practice, or whether he had had cases which had not terminated so successfully. He (Mr. Hawkins) should be very much disinclined to interfere with a well anchylosed joint, especially the hip-joint, where extensive disease had existed. The cases related by the author certainly appeared to be extraordinarily successful, but he should be glad to know whether there was any return of the disease, or whether in any cases matters had been left worse than before. He had seen great improvement in the shape of extremely distorted joints by properly applied instruments, without rupturing or dividing the tendons.

Dr. WOOD bore testimony, from personal observation, to the very successful termination of the case of the officer of artillery mentioned by the author.

Mr. SPENCER WELLS said he had seen Langenbeck's practice in Berlin in 1853, and could testify to the groundlessness of the fears expressed by Mr. Hawkins as to the after results of the system. He saw six cases in which the operation was performed—two upon the elbow-joint after a fracture of the in-

ternal condyle of the humerus, one or two upon the hip-joint, two or three upon the knee-joint, and in no case did a bad symptom present itself. The patients were fully under the influence of chloroform, and one of them was operated on a second time. The success of the operation had encouraged him to perform it himself in a case in which the internal condyle of the humerus had been fractured; the limb had been firmly flexed upon the arm, but it yielded to extension, and motion was re-established without any ill effect.

Mr. BRODHURST said that on a recent occasion at Vienna, a paper was read by Pellassiano on partially anchylosed joints. A discussion followed, which was stopped by the President (Dumreicher) observing, that the question had been already settled; the division of tendons being considered in Germany unnecessary, forcible extension without such division being all that was required. It was in consequence of that statement that he (Mr. Brodhurst) had brought the subject before the Society. It appeared to him that the President had prejudged the question, and that (judging from the cases of Langenbeck and Louvrier, the tendons ought to be divided where great rigidity existed, though in other cases, such as those to which he had referred, the division was not necessary. He had seen no evil results from extensions, except in one case in which a troublesome inflammation was set up, but it was overcome, and motion was subsequently gained. It was true, as Mr. Lee had observed, that the structure of the joint was changed in such cases; but he had not found it necessary to divide the ligaments. Indeed he should hesitate to extend the limb immediately after having used the knife. That, he believed, had been the great fault committed in the operation, leading to inflammation, abscess, and other untoward symptoms. He had not more than fourteen cases, all of which had turned out extremely well. It was difficult to lay down the pathological conditions in which this operation should be performed, since they differed so extremely. In some cases the adhesions were within the joint, and in others they were external. The cases in which the joint was not immediately implicated, were of course the most favourable for the operation. In one of his cases resection had been proposed, and it was only because such a violent operation had been suggested that the patient had been sent to him (Mr. Brodhurst).—*Med. Times and Gaz.*, April 4, 1857.

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37. *Excision of the Head of the Femur and Floor of the Acetabulum for Caries combined with Febrile Abscess.*—Mr. HENRY HANCOCK records (*Lancet*, April 25, 1857) the following remarkable case:—

"Timothy D——, aged 14, admitted under my care, into Charing-cross Hospital, in July, 1856, with disease of the hip-joint. Five years before, observing a swelling in the groin, he attended at the Middlesex Hospital, but got worse, and was made an in-patient. He remained there five months. Two years afterwards, abscesses formed around the joint; and, eighteen months ago, he first came under my care at Charing-cross Hospital, where he remained three months, when he left apparently cured. He continued able to walk for ten months, when he was attacked with severe pain in the knee, which increased so much, that upon his application I again admitted him into the Hospital. Shortly afterwards, abscesses formed around the hip-joint, opening behind the trochanter, and also low down on the back of the thigh; and, subsequently, an abscess burst in the groin; and a probe introduced into this opening passed readily into the pelvis. He, in the course of time, became so emaciated and worn out with the profuse discharge, night-sweats, loss of appetite, &c., that it was evident he could not long survive if something were not done for him. Great prostration and cough supervened, and his sputa became streaked with blood. I therefore requested Dr. Willshire to examine his lungs. He did so, and pronounced them free from any cause contraindicating an operation. Having so far as possible ascertained that the disease was confined to the hip-joint and pelvis, I examined the inside of the latter with a probe through the opening in the groin, and then discovered perforation of the acetabulum. Under these circumstances, I concluded that the pelvic abscess, and the boy's condition generally, were due to hip disease, and that by removing the head of the femur, and the floor of the acetabulum, I might not only get rid of the

diseased bone, but also by affording a free and depending opening for the discharge of the matter, the pelvic abscess might be approximated to the condition of an ordinary abscess, and thus the patient be saved; and I accordingly proposed to my colleagues to remove the head of the femur and floor of the acetabulum, and so much around it as the extent of the disease required, the patient having agreed to undergo whatever I might advise. On the 6th of December, 1856, the patient having been submitted to the influence of chloroform, and placed upon his left side on the table, I, assisted by Mr. Canton, Mr. Hird, and Mr. Barwell, commenced the operation by making a crucial incision over the great trochanter of the femur, extending about three inches beyond in all directions. The flaps having been reflected, a circular incision was carried round the head of the bone, which remained in its cavity, cutting through the glutæi, the muscles inserted into the digital fossa, the pectineus, &c., and opening the capsular ligament. Upon examination by the finger, the neck of the femur was discovered to be so much involved in the disease that I decided upon cutting through the bone immediately below the great trochanter; after which, the head of the bone was removed without difficulty. When this was done, the acetabulum was found to communicate by two openings at its deepest part with the pelvic abscess. I endeavoured to excise the floor of the acetabulum with the bone-nippers, but could not, and therefore with a metacarpal saw I cut round the acetabulum, removing the whole of the diseased bone, exposing the thickened pelvic fascia, and leaving a large opening for the escape of the matter from the pelvic abscess. It has been stated in another journal that I gouged away the several portions of the acetabulum. This is an error; I did not use that instrument at all. The flaps were then brought together, and united by sutures, except opposite and below the opening in the acetabulum, where they were kept separated by lint. A splint, extending from the armpit to the foot, was next applied, as the leg could now be straightened without difficulty, and the patient returned to his bed. Very little blood was lost during the operation, and no vessels required tying.

"The operation was followed by almost instant relief of his constitutional symptoms. He was a little sick for the first forty-eight hours from the chloroform, but otherwise his course has been one of uninterrupted improvement. His countenance soon became cheerful and free from anxiety; his night-sweats ceased in two days from the operation. On the third day, the wound in the groin was entirely healed. The discharge from the wound made at the operation, which for the first few days was very abundant, gradually became thicker and diminished in quantity until the present time, when it does not amount to a teaspoonful during the twenty-four hours. He was able to sit up in bed for the first time for nearly a year with his knees straight fourteen days after the operation. In there weeks, he dressed himself, and sat in a chair by the fire. In five weeks, he was able to walk with a crutch and a stick; at the end of eight weeks, however, he imprudently dispensed with both crutch and stick; inflammation ensued, followed by abscess external to the pelvis. This, however, has subsided, and he is now progressing steadily, gaining flesh and strength, at the present time being able to walk in the park daily."

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38. *Treatment of certain Diseases of the Knee-joint by the Operation of Resection.*—Mr. Price read before the Medical Society of London (March 14) an interesting paper on this subject. He stated that nearly seven years had elapsed since the revival of the operation by Mr. Fergusson. During this interval the subject had excited the greatest attention, and many opinions had been offered regarding its value and its right to be admitted as a recognized operation in surgery. It could not be denied that the general feeling had been obnoxious to its admissibility, and although it had been approved by many excellent authorities, it had nevertheless been condemned, in a manner, perhaps, unprecedented in the history of surgery. Opinions had been expressed by many quite incapable of forming a correct judgment, and many whose high attainments had eminently fitted them to be impartial judges of the merits and faults of the operation, had, with a spirit unbecoming their character and dignity as surgeons, placed themselves in direct opposition to every improvement

and suggestion connected with its advancement. It was admitted that many errors had been committed, and that the intention of the operation had on more than one occasion been overstrained, yet in the limited number of cases recorded, a success had been achieved which forcibly disposed of all theoretical objections which had been offered, and fully warranted a more extended trial. The author then eulogized Mr. Butcher's labours in connection with the subject of resection, and thought that the ancient motto, "*Nemo ex libris evasit artifex*"—no man becomes a workman from books—was, perhaps, appropriate as applied to himself on the present occasion, as the remarks he had the honour of making to the Society were derived entirely from experience. Twenty cases of the operation had fallen under his immediate notice—one-fifth of the entire number which had been recorded since it was adopted by Park in 1781. Three of these operations had been performed by himself; in the remainder he had been either an assistant or an interested spectator, and had enjoyed the privilege and opportunities of watching the subsequent treatment, which had enabled him to accumulate a mass of information and facts which had strongly impressed him with the value of the operation on all suitable occasions. The author then lamented the frequency of amputations when resection was not only admissible, but a right and superior operation. The principal affections of the knee-joint, which are more or less amenable to the operation of resection, were classed under the following heads:—

1. Inflammation of the synovial membrane, acute and chronic.
2. That class of affections which Sir B. Brodie includes under the title of "where the synovial membrane has undergone a morbid alteration of structure."
3. Where ulceration of the articular cartilages had arisen as a primary affection.
4. Scrofulous disease of the cancellated ends of the bones entering into the formation of the joint.

Discarding all very acute cases of these affections, with their various complications, few surgeons probably could be found who would venture, on practical grounds, to dispute that these diseases are frequently amenable to the great conservative operation of resection. With regard to cases of acute inflammation of the synovial membrane demanding prompt removal of the source of irritation, the author believed resection was, as a general rule, unwise. The acute nature of the symptoms, the sympathy of neighbouring structures, and of the entire system, with the unfavourable condition in general of the patient, were sufficient reasons for preferring amputation. The danger following resection in such cases was the liability of the ends of the bones to take on an unhealthy action. Experience had incontestably proved that such an untoward occurrence was very apt to ensue. Pyæmia had on several occasions carried patients rapidly away, and acute necrosis had also quickly terminated in death, or demanded immediate amputation, provided a limitation of the inflammation, and subsequent exfoliation of the part, could not be expected. In the more chronic forms of synovial disease, the operation of resection was of far higher value. In cases of this class, not by any means uncommonly met with amongst the poorer classes, the proceeding had been frequently resorted to with much benefit. During the last six years, the statement of an eminent author (Brodie "On the Diseases of the Joints"): "Fortunately in this extremity an accurate diagnosis was of no great importance, as it can lead to no essential difference in the surgical treatment of the case," had been disproved, for amputation had been superseded by the more humane operation of resection. The author, however, was by no means inclined to admit that such cases were the most favourable for the operation, but he did admit that they could be, with propriety and judgment, treated in this way much to the advantage of the patient and to the credit of surgery. If there be in reality any value in the operation, the author believed it to be exemplified in its adaptation to the treatment of various cases which were included under the title of "where the synovial membrane has undergone a morbid change of structure." A moment's consideration would convince the most obnoxious dissenters to the operation of its great advantage. There was seldom seen any extensive and acute inflammation

breaking down fibrous, cartilaginous, and bony structures; very often no emaciation, and long suffering inducing hectic and irritative fever. The patients were for the most part otherwise healthy, and, perchance, submitted to an operation more for the sake of convenience and comfort than an escape from suffering and death. These, and other features, would pre-eminently recommend resection to the more general consideration of the profession for affections of this class. In cases of acute ulceration of cartilages, occurring as a primary affection, the author was led to take an unfavourable view of resection, provided the symptoms were extreme, and especially if evidence existed of the participation of the bones in the disturbance. In cases of a more chronic or subacute character, the operation must be looked upon as highly advantageous, as experience and facts have attested the good effects of its adoption on many occasions. It was, however, to the employment of resection of scrofulous disease of the knee-joint, commencing in the cancellated tissue of the bones, tibia, and femur, that the author particularly wished to direct attention. Great stress was placed upon a right appreciation of an operation more or less applicable on many occasions. The pathological changes that take place in the meshes of the ends of the bones, and their cartilaginous coverings, were well illustrated by some beautiful drawings, from the pencil of Dr. Westmacott, from cases which had been treated by Mr. Fergusson, and by the author. From the history of cases of this class in various stages of disease that had been treated by the author and other surgeons, it appeared that resection was an operation highly useful in the treatment of joints extensively destroyed by strumous disease, and that extensive destruction of the cancellated ends of the bones is of little consequence, provided all the disease be removed from contact with the healthy parts. The extent to which parts so diseased might be removed, was illustrated by a remarkable case, under the care of Mr. Jones, of Jersey, in which the upper half of the tibia, as well as the entire articulation, was removed with success. These being the principal classes of disease for which the operation had been undertaken, the author next proceeded to inquire how it was that, considering the apparent advantages of resection, so much dispute regarding its employment had arisen? This was attributed, in a great measure, to the general ignorance, but professed knowledge, that existed regarding it, and also to the lethargy and unwillingness that prevailed amongst many surgeons to adopt a new proceeding, or which, having been adopted on one occasion, and signally failing, through want of due skill and judgment, had not been repeated, the ill success being unfairly attributed to the operation. Many teachers had attempted to instruct their pupils on a subject concerning which they were themselves not particularly enlightened, and in so doing had laid themselves open to the criticism of the better informed. The operation had lately been denounced by Mr. Syme as "bloody and formidable;"[1] and yet, at the time, that gentleman was somewhat acquainted with the operation, he distinctly taught and wrote that "there is not much bleeding, but one or two of the articular branches may require to be tied."[2] If, then, the former expression had reference *solely* to the subject of hemorrhage, occurring at the performance of the operation, Mr. Syme, without any further experience, would appear to have contradicted himself. A comparison between the results of resection and modern amputation of the thigh was shown to be unfair. If comparisons were to be drawn between resection and another operation or injury, the author would feel more inclined to liken it to a severe compound fracture. With regard to the performance of the operation, the advantage gained by not removing the entire epiphyses was shown to be advantageous in two ways. Osseous union would be more likely to take place, and the new product would be in many ways better adapted as a bond of union; and secondly, should unhealthy inflammation of the ends of the bones succeed in destroying the bony structure, provided the epiphyses have not been removed, the mischief may be entirely confined to this portion of the bone. Such an unfortunate occurrence was apt to arise from two causes: damage inflicted on the

[1] *Vide* Introductory Lecture, by Mr. Syme, in *The Lancet*, Nov. 15, 1856.
[2] Syme on Excision of Diseased Joints, 1831.

ends of the bones at the time of the operation, or during the after-management. Both these mishaps the author had seen, on more than one occasion, to prove fatal. He must again call attention to the great importance of correct after-treatment, and strongly recommended the splint described on a former occasion by himself. Division of the hamstring tendons had been devised, "as all tendency to after-mismanagement is checked. Such a statement had been made partly on supposition, for hideous deformity had more than once arisen from so doing; it was therefore necessary duly to consider the propriety of this proceeding.

Many excellent water-colour drawings and casts of limbs after the operation were exhibited, showing the condition of various specimens of diseased joints which had been treated by resection.—*Lancet*, March 21, 1857.

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39. *Bony Union after Fracture of the Cervix Femoris within the Capsule.*—T. Bryant, Esq., exhibited to the Pathological Society of London (Feb. 3, 1857) a specimen of this, which is worthy of note in connection with the valuable paper by Prof. Mussey, inserted in our preceding number.

"Mary H., aged 60, a lunatic inmate of the asylum at Guy's Hospital five years ago, when walking in the garden, fell and fractured her right thigh-bone. All the symptoms of fracture of the neck of the femur within the capsule were present, clearly indicating the character of the injury. A long splint was applied; but much difficulty was experienced in preserving the leg in the right position, from the restlessness of the patient. After some weeks' confinement she was allowed to sit up, but her health soon began to fail, and she never walked again, and on June 30 she died. The specimens shown consisted of the upper parts of both thigh-bones. On the injured side union was complete, and had partly been effected by bone, partly by cartilage, and in part by fibrous tissue. The whole of the neck had been absorbed, and the articular head was united directly to the base of the great trochanter. The union was very firm, and the head of the bone was much indurated."—*British Medical Journal*, March 14.

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40. *Ununited Fracture Remedied by Operation.* By James Syme, Esq.—There are few results of surgical practice so distressing and embarrassing as imperfection in the osseous union of a broken bone, since, in general, so long as this condition continues to exist, the limb concerned is rendered nearly if not entirely useless, while the means of remedy hitherto employed have proved uncertain of good, and sometimes even productive of bad effects. When there is merely a slight degree of mobility at the seat of injury, so that, although quite sufficient to prevent any useful exercise of the limb, it may require some care for its detection, there will be a favourable prospect of success, even after the expiration of several months, through the employment of means for the complete prevention of motion; and I have put upon record cases in which even the thigh-bone was rendered perfectly rigid by this simple expedient, in circumstances of apparently a very hopeless character, from the long duration of flexibility. But when the extremities of the bone remain quite separate, or even overlap each other, and are surrounded by a sort of fibrous capsule with cellular interstices, so that they admit of hardly less free motion than if there really were a joint between them, it is evident that merely preventing motion could not possibly prove sufficient for the production of an osseous union. It has been supposed that the difficulty thus presented might be overcome by rubbing the ends of the bones together; by stirring up the texture connecting them through the agency of needles or tenotomy knives; by passing setons through the flexible medium of union; and by inserting pegs of ivory into the respective osseous surfaces. But, so far as I am able to form an opinion on the subject, all of these means are absolutely useless, and owe any share of credit that they may have acquired to the prevention of mobility which is conjoined with their employment. In short, I believe that the procedures in question cannot accomplish recovery in any case not remedial by the enforcement of rest, and that they, consequently, must always be useless, if not injurious. There is still another mode of treatment, which consists in cutting off the ends of the bone, so as to obtain two fresh osseous surfaces, and place the limb in a

condition similar to that of a compound fracture recently inflicted; and this, I feel persuaded, affords the only reasonable ground for expecting success in cases not amenable to the influence of immobility. It is true that the experience of this method has not hitherto been at all satisfactory, through want of due attention to some circumstances in the mode of procedure, which must in a great measure determine the result. Of these may be specially mentioned an imperfect removal of the ends of the bone, and a want of complete immobility after the operation. The following case will, I hope, tend to illustrate the importance of attending to these points.

J. H., æt. 34, a private of the —— foot, while discharging some duty in the Redan, on the 8th of December, 1855, after the occupation of Sebastopol, was blown up by a Russian mine, which had escaped detection, and, in addition to some slighter injuries, sustained a fracture of the left arm between two and three inches above the elbow. He walked up to his regimental hospital, where splints were applied, and retained for a month, when, there being no signs of union, the ends of the bone were rubbed together, and supported by a starched bandage. He left the Crimea on the 3d of February, and was sent to the hospital at Renkeioi, where a seton was passed through the seat of fracture, and retained for five weeks without any benefit. On the 20th of May he proceeded homewards, and, after a long voyage of nearly two months, arrived at Portsmouth, whence he was transferred to Chatham on the 17th of July. No attempt to restore rigidity was made there, and at the end of two months he was dismissed the service, with a pension of one shilling per day, in consideration of his disability, which was regarded as equal to the loss of a limb.

In the hope that relief might still be afforded, he applied to me on the 22d of January last, nearly fourteen months from the date of the injury; and finding that the arm was entirely useless through the extreme mobility of the ends of the bone, which overlapped each other to the extent of more than an inch, I resolved to adopt the only procedure that, in my opinion, afforded any reasonable prospect of remedy under such circumstances, which was to remove the ends of the bone, and afterwards maintain the most perfect rest. In preventing the motion of a joint, it is a most important principle, never to be forgotten, that as most of the muscles pass over two articulations, it is impossible to keep any one perfectly quiet without placing the whole limb under restraint. Proceeding under this impression, my first step was to have the arm put in an easy position, with the elbow bent at a right angle, and then covered from beyond the shoulder to the tips of the fingers with pasteboard and starched bandages, so as to form a case, which, when it became dry, effectually prevented the slightest movement in any of the joints. This case was next cut up on one side from end to end, so as to allow the arm to be taken out of it, and undergo the requisite operation, which was performed under chloroform. An incision having been made along the outer edge of the triceps, I exposed the upper end of the bone, and sawed off a portion of it sufficient for obtaining a complete osseous surface. The lower end, lying anterior to the shaft in a sort of capsule, could not be subjected to the saw, but was removed, to the extent of more than an inch, by cutting pliers. The arm was then supported by a couple of splints, and the patient lay quietly in bed for a fortnight, when the limb was placed in its pasteboard case, in which an aperture had been made over the wound, then nearly healed, and discharging a very little matter that soon ceased entirely. The patient, feeling that the slightest motion was impossible, even if he had wished it, was relieved from any further restraint, and no longer remained in bed. At the end of a month, or altogether six weeks from the date of the operation, which was performed on the 30th of January, the limb was examined, and found to be quite straight, with a firm osseous union; so that the patient was able to leave the hospital, not only with his comfortable pension, but also with a perfectly useful arm.—*Edinburgh Med. Journ.*, May, 1857.

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41. *Case of Myopathic Luxation.* By Dr. Friedberg.—O. H., when fifteen months old, fell with his left hand stretched out, and some hours after complained of pain in the arm. Two days later, swelling was observed at the

wrist, as well as at the shoulder and left cervical region; that of the latter parts not disappearing for five or six weeks. It was found then, that although the child could use its arm, it forbore as far as possible, occasionally complaining of pain in it. At a still later period, frequent fugitive convulsive movements of the limb appeared, as well as progressive emaciation.

Various means having been uselessly tried, the boy, two years after the accident, was brought to the author's clinic. The left arm was then found to be an inch longer than the right. The upper arm had lost a sixth of its circumference, but the other parts of the extremity were less emaciated. The emaciation affected the *pectoralis major*, the *latissimus dorsi*, the anterior superior portion of the *trapezius*, and all the muscles proceeding from the shoulder-blade to the arm. The middle portion of the deltoid had almost disappeared, as had the *supra-spinatus* at its external two-thirds. The scapula and humerus were normally developed. The acetabulum was empty, but its capsule was not thickened. The head of the humerus, which had sunk downwards an inch, could be easily restored to its place, from which, however, it immediately fell down again. Slight fibrillary contractions were observed in the muscles about the shoulder, the force of which was somewhat increased on the application of cold. The child could not execute any movement of the upper arm; while electricity only excited feeble contractions in the *pectoralis*, *latissimus*, and a portion of the *deltoid*, the middle of this last and all the muscles of the humerus being insensible to its action.

The child's health and development were good, and the author saw him yet a year later. The affection had continued to make progress, so that the left arm was a fourth less in circumference than the right, and hung motionless by the side; while the elasticity of the muscles of the forearm had diminished, as had the power of using the hand. The muscles attached to the humerus seemed like mere thin relaxed cords, and its development, as well as that of the scapula, had been remarkably retarded. The disappearance of the *deltoid* was almost complete, and the glenoid cavity seemed to have become more superficial. The lower half of the *trapezius* and the *rhomboideus* had also remarkably diminished.

Thus it appears that all the symptoms which have been assigned to the so-called *progressive muscular atrophy* may arise from traumatic inflammation of muscles. At the time of the accident in this case, the muscles surrounding the shoulder-joint underwent violent traction through the sudden pushing upwards of the head of the humerus. This was followed by pain and increased sensibility, and afterwards by the relaxed state of the arm. The inflammation not being dissipated, led to degenerative atrophy, which extended from the muscles originally involved to the others in their vicinity.

In explanation of the direction taken by the luxated humerus, Dr. Freidberg observes, that the disturbance of the nutrition of muscles, which leading to their relaxation, may permit dislocation, may occur in various ways, whether from the operation of violence, the propagation of inflammation from a joint, the poisoning the blood as by lead, or scarlatina contagion, through a continued interruption of innervation, or a diminution of the supply of arterial blood, &c. This deprivation of their elasticity renders them unable to oppose the action of their antagonists. This myopathic luxation may occur in different joints under more or less complicated conditions; and it is met with in its simplest form in the shoulder. Here it might indeed *à priori* be especially expected to occur, owing to the extensibility of the capsule and ligaments, rendering the retention of the head of the bone within the cavity exclusively a muscular action. And thus it is, while in the shoulder-joint a complete luxation may be the immediate effect of a myopathic paralysis, in other joints such luxation is at first only incomplete, its completion depending upon other secondary circumstances. For the production of a dislocation perpendicularly downwards, as observed in the present case, it is essential that the *supra-spinatus* muscle be either torn, or have lost its elasticity in consequence of the disturbance that has been produced in its nutrition.—*B. and F. Med.-Chirurg. Rev.*, April, 1857, from *Oesterreichische Zeitschrift*, 1857, No. 1.

42. *Inflammation and Rupture of the Rectus Abdominis.*—In our number for January last we published an interesting case of rupture of the right rectus abdominis muscle, by Dr. Richardson, of Louisville. The following abstract of a paper recently contributed by VIRCHOW (*Würzburg Verhandlungen*) is interesting in relation to that case.

"During the last few years, several cases of inflammation and rupture of this muscle have come under his notice, which have proved interesting from the analogy they bear to examples of myocarditis and rupture of the heart. In most of the cases, the rupture has occurred about midway between the umbilicus and the pubes, usually being confined to one side. In some cases in which he has found parenchymatous changes without rupture, these have always been found towards the lower part of the muscle.

"Isolated rupture of muscles from external violence are of very rare occurrence; and where great traction has been exerted, it is rather the tendon than the muscle that gives way. So, too, the ruptures which sometimes take place from excessive action, as in tetanus, must be very rare, and of a microscopic character. Those resulting from excessive rigor mortis, described by Rokitansky, M. Virchow has never seen. The comparatively frequent parenchymatous or spontaneous rupture presupposes organic changes of the muscle, inducing a pathological fragility. It is characterized by the slight amount of force necessary for its production, and the existence of changes in the immediate vicinity of the rupture, which are not infrequently, to greater or less extent, in other parts of the muscle. These changes Virchow has exactly described in his account of muscular inflammation, in the 'Archiv' (band iv. p. 266). They may consist in either a true fatty metamorphosis of the interior of the primary bundles, or of peculiar softenings which at last lead to a granular degeneration of the muscular substance. This last form it is that often excites inflammatory appearances, which are especially seen during metastatic processes, but which may be produced in the same way as in the heart when its supplying arteries are obstructed. The first form takes place more slowly, as in aged persons, in paralytic parts, and after protracted muscular inactivity.

"So far as Virchow has observed, rupture of the rectus has always been preceded by this organic metamorphosis of its substance; and in quite recent cases, the same changes have been found at the circumference of the ruptured parts which have been found in diseased but unruptured muscle. After describing the microscopic appearances at the various stages of the affection, he goes on to say that he has always found rupture commencing at the posterior or peritoneal surface of the diseased muscle. The ruptured part becomes at once filled with blood, which coagulates and may be infiltrated, or projecting and visible through the peritoneum. Of the 7 cases Professor Virchow has met with in three years, 4 occurred in women aged nineteen, thirty-five, fifty-nine, and sixty-five years; and 3 in lads of fifteen, twenty-two, and twenty-three years. Four of the cases were examples of typhus, most having entered the ulcerative stage; in 2 others there was marked tuberculosis, and in another scorbutus. In most of the cases the proximate cause of the rupture was violent coughing. Virchow believes that some of the cases described by authors as "neuralgia epigastrica," "peritonitis musculosus," "rheumatismus muscul. abdom.," may be examples of such rupture, going on in certain instances to suppuration."

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43. *New Method of Operating for Impermeable Urethra.*—Mr. SYME presented to the Royal Medical and Chirurgical Society a paper on this subject. In a former communication upon the remedy of stricture by external incision, the author endeavoured to show that impermeability was not consistent with the nature of stricture, and that whenever the urine could pass through the urethra an instrument might be made to do so; not perhaps at once and with ease, but always through time and proper management. Though thus certainly permeable while merely contracted, the canal was undoubtedly liable to complete obstruction in consequence of wounds, and also of sloughing, when it had been found to constitute a very troublesome subject of treatment by the operation hitherto employed—viz., cutting upon the point of a catheter passed down

to the seat of obstruction, so as to clear a way for its introduction into the bladder—a process rendered difficult by the thickness and condensation of the textures concerned, and also dangerous as well as uncertain by the risk of not cutting exactly in the proper course of the urethra. Two cases of this kind—one from a provincial town in Scotland, and another from St. John's, New Brunswick, in both of which not a drop of urine passed through the urethra for many months, the urethra being completely obstructed to the introduction of instruments—having lately come under the author's care at the same time, led him to reconsider the subject, and devise the following plan instead of the one usually employed, which for the reasons just mentioned he was unwilling to adopt. An instrument like the common lithotomy staff, with a groove on its concave instead of the convex side, being introduced through the fistulous opening of the perineum, and confided to an assistant, the guide director employed for the division of strictures by external incision might be passed down to the seat of obstruction, and while the staff was supported by pressure upon the perineum to thrust through the opposing substance in the course which it ought to take if the canal were free, enter the groove, and so pass into the bladder, when the state of matters would be similar to that of a stricture requiring division after having the director passed through it, so that the operation might be completed in the same way as upon such an occasion. This procedure was executed in both of the cases, without any difficulty in one, and without more in the other than might have been expected from the extreme degree of injury which the patient had sustained by falling twenty feet, fracturing the pubis, having the bladder punctured, &c. &c. The first patient was dismissed from the hospital perfectly well at the end of seven weeks after the operation; the second, passing urine in a full stream, but in general only by drops through the perineum, appears also to have the prospect of complete recovery at no distant date. While quite aware that the formation of a new urethra is much less promising in its result than the enlargement of an old one, the author expressed his hope that the method which he had proposed would facilitate the procedure, and lessen the risk of its bad consequences.

Mr. Coulson thought there were many cases in which the plan proposed by Mr. Syme would not be applicable. There might be a great portion of the urethra obliterated anterior to the perineal opening, in which case the mode of propelling the small director would not apply; or the operator might not always be able to get the staff from the perineal opening into the bladder, on account of the tortuous course it would have to take. He had seen many such cases, in which he considered these difficulties would be almost insuperable.

Mr. Benjamin Travers referred to the fracture of the pubis, mentioned as occurring in the second case, and said it was a very serious and often fatal complication. It coexisted with extensive laceration in the neck of the bladder. He suggested that the paralysis of the rectum was explained by the circumstance of the fracture. The difficulty connected with Mr. Syme's operation would, he conceived, in many cases be to hit the posterior opening, and push any kind of instrument thence into the bladder. He did not see the advantage over the old operation practised for so many years past at St. Thomas's Hospital.

Mr. Hutchinson said he had hoped, from the title of the paper, and the reputation of the author, to have heard a description of some expeditious plan of getting through those strictures ordinarily termed impassable, and without any perineal fistula. When a perineal fistula existed the case was a comparatively easy one. The operator had but to pass a catheter by the fistula into the bladder, retain it there as a guide in the subsequent part of the operation, and then cutting on the point of a full-sized instrument passed by the penis as far as the obliterated tract, there was no difficulty whatever in making an incision between the two portions of the urethra. The real difficulty occurred in cases in which no direct fistula from the perineum existed, and the posterior tract of urethra could not be found. Then again, in cases of obliteration, one never knew the length of the obliterated tract, and often the induration was of extreme density. He thought there was some objection to the use of force with so small an instrument as the grooved director recommended by Mr. Syme,

from its liability to bend, and to pass out of the proper direction; as he had once found it do in the course of his own experience.

Mr. Syme, having been requested to do so, explained more particularly the operation which he had proposed; and, in reply to Mr. Coulson's objection, that it would be rendered difficult by the tortuous direction of the fistula, stated that the passage was always perfectly direct, and also wide, unless perhaps just at the orifice, since the cause of true obliteration, for which alone the operation was intended, resulted from either sloughing or wounds, and not from the gradual extension of purulent matter, as in the ordinary cases of perineal fistula, which always admitted of remedy, either by dilating or dividing the stricture that gives rise to them. As to the opinion expressed by Mr. Hutchinson, that the operation in question would not be applicable to strictures so tight and tough as to bend metallic instruments employed for their dilatation, Mr. Syme again explained that the procedure which he had proposed was intended for the remedy, not of *stricture*, but of *obliteration*, and that he believed the former condition would never be found to require the old expedient of cutting upon the point of a catheter, if the introduction of bougies were perseveringly attempted with skill and care, and especially with such gentleness. as must entirely preclude the risk of bending a metallic instrument.—*Med. Times and Gaz.*, March 14, 1857.

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44. *Excision of an Enlarged Third Lobe of the Prostate in a Lithotomy Operation.*—The accidental removal of small portions of the prostate in cases of lithotomy in patients having enlargement of that gland has not unfrequently occurred. We are not aware, however, that an intentional excision of any part of it was ever practised prior to the one we now have to notice. About four years ago we witnessed, at St. Bartholomew's, a lithotomy, by Mr. Lawrence, in an old man in which the stone was large, and some delay in extracting it after it had been grasped by the forceps occurred. At length the parts yielded, and to the surprise of some lookers-on, a mass of whitish structure fell out before the stone. This proved to be a portion of prostate tissue, and was about the size of half a walnut. It was clean and healthy looking, and did not present any ulceration, exhibiting the appearance of having been enucleated and not possessing any covering of mucous membrane. Mr. Lawrence stated that he did not think the man's prospect of recovery in any way diminished by the occurrence of it. A good recovery resulted. This is the only case in which the writer has ever himself witnessed the accidental removal of portions of the prostate of any size worth notice; but it will be in the memory of many members of the Pathological Society, that at one of its meetings about a year ago, Mr. Fergusson stated in the discussion that the occurrence had frequently happened to himself, and that he had never seen reason to attribute ill consequences to it. The practice of deliberately excising a portion of the gland must be viewed, however, from quite a different point, and as already said, we are not aware that any surgeon has heretofore adopted it.

On Saturday last, a man aged 65, moderately stout, and in fair health, was submitted to lithotomy in the theatre of King's College Hospital. Mr. Fergusson had more than usual difficulty in seizing the stones, on account of their lying in a deep hollow behind the prostate. He succeeded, however, in little more than ordinary time, and two flattish calculi of moderate size were extracted. He then examined the wound carefully, and, introducing a pair of straight narrow-bladed lithotomy forceps, grasped something of considerable size, and then asked for a long probe-pointed bistoury. The latter instrument was introduced deeply into the wound, as if for the purpose of enlarging the opening in the neck of the bladder, and then, much, we believe, to the wonderment of all present, turned with its edge towards the median line, and made to cut very freely across the under part of the first incision. This liberated the forceps, which were withdrawn grasping a mass the size of a pigeon's egg of firm, whitish, fleshy structure. This when taken from the forceps proved to be the third lobe of the prostate. It was conical in shape, and had a broad base, the latter presenting an oval cleanly cut surface of about an inch across. On its apex was an elevated surface about as large as a fourpenny-piece, which was

ulcerated and granulating. Excepting at this spot the mucous membrane was sound and the structure healthy. No material hemorrhage attended the operation, and after the man had been removed to his bed, Mr. Fergusson made the following remarks to those present:—

"The man upon whom, gentlemen, you have just seen me operate, was sent up from the country some weeks ago, having long suffered from stone. I ascertained the existence of a calculus, and suspected that there were two, and finding also that he was the subject of a greatly enlarged prostate, and had suffered from difficult micturition on that account, I preferred submitting him to lithotomy instead of lithotrity. You would observe that in sounding him with the staff, which has a long curve, I could not strike the stone, and that I was obliged to use an ordinary sound with a very short curve in order to do so. This confirmed my opinion that the stones lay in an unusually deep basin, behind an enlarged prostate. After the incisions had been completed the difficulty in sufficiently elevating the forceps to make their blades dip into this hollow and seize the stones, was considerable. My finger in the wound came against a large third lobe of the prostate, and the easiest direction in the bladder was by one side of this, and not over its surface. The second of the calculi I extracted with the forceps in the sulcus, on one side of this projecting mass. Having completed the operation, as far as the calculi were concerned, I recollected how often in treating cases of enlarged prostate I had wished that it were practicable to remove the source of obstruction by operation; and it occurred to me that this was the very case in which to do it. Were the man to be left with his prostate in the condition in which I had ascertained it to be, there could be no doubt but that the operation would be but partially successful in relieving his urinary symptoms, however satisfactorily it might have accomplished its intended object. Believing, therefore, that the excision of the projecting portion promised more of advantage than it incurred of risk, I determined to practise it. The instruments used were a pair of ordinary straight lithotomy forceps, and a probe-pointed bistoury, such as is generally employed for enlarging the opening in the prostate when necessary. I grasped the prominent lobe firmly by the former, and holding it forwards, sliced it freely through beneath, taking care to keep the knife close under their blades. I am not aware that such a procedure was ever before adopted, and must leave it to experienced lithotomists, who alone are capable of estimating its merits and risks, to say whether it was a warrantable one. That some additional risk has been incurred there can be no doubt, as a second wound, and one of considerable size, is left to heal. Still, on the whole, I am strongly of opinion that I have done what the circumstances of the case demanded, and have conferred a great benefit upon my patient. I would direct your attention to the circumstance that there is an ulcer on the most prominent part of the removed lobe, and would also remark, that the incision made in removing it does not appear to have joined that made in the lithotomy at the left side. There is, probably, a narrow bridge of mucous membrane between the edge of the lateral wound and that made by slicing off the growth. The growth is removed quite to the level of the mucous membrane of the urethra, and the passage into the bladder is now most free."—*Med. Times and Gaz.*, April 18, 1857.

45. *Vesico-Vaginal Fistula.*—Dr. Jas. H. Sawyer, Master of the Coombe Hospital, and Prof. of Midwifery, relates (*Dublin Hospital Gazette*, March 1, 1857) the following case of vesico-vaginal fistula in which he operated successfully by the plan of Mr. Maurice Collis:—

"On the morning of the 17th of May last, I was sent for to the Coombe Hospital, in the absence of Dr. Rigland, the Master on duty, and for the first time saw the subject of the following case.

"Fanny Wilkinson, 24 years of age, remarkably small, and very excitable; married 15 months; first child. Admitted into the labour ward at 3 o'clock P. M. on the previous day. She stated that labour had set in on the 15th, and that the waters had come away before her admission. On examination the os was found fully dilated; head presenting; pains strong and frequent. On the ensuing day, as she had not made progress, Dr. Kidd, the assistant to the Mas-

ters, was sent for. He promptly introduced a catheter, though with considerable difficulty, owing to the pressure of the head on the pubes. Having relieved the bladder, and finding no urgent symptoms, he directed that he should be sent for if symptoms of constitutional irritation should arise before his return.

"I saw her at 11½ P. M. in consultation with Dr. Jameson, and found her in a state of exhaustion, with quick feeble pulse, and irritable stomach; the external parts were tender, hot, and dry. Under these circumstances, and as the head had remained stationary upwards of nineteen hours, we decided at once to terminate the labour. I could not hear the fœtal heart, but as the placental soufflet was evident, and the pupil on duty assured me he had distinctly heard the fœtal tick a short time previous, I was reluctant to resort to the perforator. I succeeded, with some difficulty, in introducing the blades of Churchill's forceps obliquely, and after considerable effort extracted a large male fœtus. The patient made a good recovery in all points, with the exception of suffering from incontinence of urine, which set in about the fifth day after the operation. The formation of a vesico-vaginal fistula was ascertained; but, as her general health was impaired, she was directed to try change of air, and to return to the hospital after two or three weeks' sojourn in the country.

"She was readmitted on the 1st of July. 1856; and a transverse oval aperture about eight lines in its long diameter, permitting the forefinger to be passed through it, was ascertained to exist immediately above the neck of the bladder. The narrowed condition of vagina, combined with the soreness resulting from extensive excoriation, made the examination very difficult. She complained that the moment she turned in the bed, or assumed the erect posture, the urine flowed. She said her life was miserable, that she was unable to earn her bread, and would gladly submit to any operation. I had the advantage of the advice and valuable suggestions of my respected friends Drs. Maurice Collis, Churchill, and McClintock; also my colleagues, Drs. Ringland and Kidd; and the hospital consultants, Drs. Jameson and Wilmot; and decided on operating after Mr. Collis's plan, on the 15th. In the mean time I had made a set of dilators, better adapted to keep the vagina well opened. I directed borate of soda wash; and also, with my colleagues' assistance, fully tried the injection of carbonic acid gas, and Dr. Hardy's chloroform bellows; but instead of diminishing sensibility, such aggravated suffering, with increased contraction of the vagina, was induced, that I was forced to put off the operation until the 25th. Two days prior to that date, I cautiously dilated the vagina with plugs of prepared sponge, smeared with extract of belladonna, which proved in this case an admirable anæsthetic. After trying different positions, I found the lithotomy posture the most convenient, and accordingly, on the 25th, having previously cleared out the bowels, and secured the hands and feet, I proceeded to the operation. It was intended to operate under chloroform, but after a few inspirations, the sudden irregularity of the heart's action compelled us to desist.

"Two dilators were passed, and pressed obliquely upwards and outwards; then the third, pressing down on the recto-vaginal septum, enabled me to get a view of the fistula. A full-sized catheter passed through the urethra, and pressed downwards and forwards, kept firm the posterior margin, and prevented the bladder from coming in contact with the knife. With Baker Brown's knife I carefully split the vesico-vaginal septum at the posterior lip to the extent of three lines, carrying the knife carefully around the commissure, and keeping close to the vesical surface. I then did the same to the lower and anterior lip, but with greater difficulty, as its aspect was turned from me. The constant welling of blood and urine compelled me to work very slowly. I then syringed with cold water, which in some degree repressed the bleeding; and with the same needles used by Mr. Collis I introduced four ligatures of ordinary housewife-thread at intervals of three lines, carefully avoiding penetrating the vesical mucous surface. I secured the ligatures over two bars of gutta percha, instead of gum-elastic, as used by Mr. C., as it is not corroded by the vaginal secretion. I was most cautious not to draw the threads too tight, and thus prevented strangulation of the lips embraced between the bars. The operation lasted about half an hour. She was then placed in bed on her

face, her body well supported by pillows. A long gum-elastic catheter was passed and secured, and one grain of opium was directed to be given every third hour. On the fourth day I examined, and was gratified to find the margins of the wound in perfect apposition, and no suppuration. I cut the ligatures, but did not remove them until the following day, that is, the fifth from the operation. The union was complete, but I did not venture to withdraw the catheter or act on the bowels until the eighth, when the following mixture was directed: Olei ricini ʒvj; tincturæ rhei ʒiij; confect. amygd. ʒiv; aquæ cinnamomi ad ʒvi.—st. ʒi. 2dis horis. This acted gently. On the eighteenth day she was walking about, able to retain the urine, and her only annoyance was a tendency to pass water frequently. This gradually subsided, and on the 14th August she was discharged in perfect health, and is at present in a good situation, and, as she declares, as well as ever she was in all her life."

Dr. Sawyer claims for Mr. Collis's plan the following advantages:—

"First—Facility of execution. Secondly—Probability of speedy union by the first intention. Thirdly—The prominence of the vesical flaps forming an admirable barrier to the urine insinuating itself. Fourthly—Comparative freedom from hemorrhage. And lastly—If it does not succeed, there will be no increase of the fistulous aperture, as after other plans."

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46. *Valvular Nature of Strangulated Hernia.*—Incarcerated hernia, in Prof. Roser's opinion, essentially depends upon a valvular mechanism. The obstruction of the contents of the intestine in the incarcerated portion arises from the folds of the mucous membrane lying valve-like against each other, and preventing the passage of gas, fluids, &c. Looking at the complete obstruction which takes place in the hernia, one might suppose that the parts concerned are compressed as closely as in an artery when tied. But all observation teaches us that no such pressure is here exerted; for while the venous circulation is only partially arrested, the arterial remains uninterrupted. Were it otherwise, indeed, the intestinal fold would become rapidly gangrenous. The question is why, if there is space enough to allow of the circulation in the part to continue, cannot we by pressure return the contents of the intestine.

The nature of the obstruction may be shown by a simple experiment. If a noose of intestine, containing some fluid or air, be brought within a ring about the size of the finger, and then pressure be made upon the apex of the noose so as to force the contents against the compressing body, complete obstruction to their passage will be found to prevail. And yet a catheter may be passed beside the intestine, and, by drawing the latter a little to one side, a considerable space will be perceived. If pressure be made in front of the encircling ring, the contents of the intestine are forced back; but if we press at the end of the noose, the portion that lies next to the ring is forced against the latter, and the canal is closed. If we open the noose on its convex side, and fill it with water, we may observe the valvular disproportion of the intestinal folds, which resemble the valves of the aorta when acting under water.

Deferring to another occasion the exposition of his theory of the taxis deducible from these views, Prof. Roser now points out the support they give to the operation for hernia, without opening the sac—a procedure he regards as one of the greatest improvements in surgery since the days of Paré. He believes it has made little progress in Germany and France, as compared with England, in consequence of the prevalence of a false theory of strangulation of hernia and erroneous ideas on the surgical anatomy of hernia. In respect to the first of these, too exaggerated an idea of the constriction that takes place has been entertained, leading to a belief that the mere dilatation of the tendinous margins could not suffice for the return of the distended and indurated hernia. The above experiment, which proves the valvular nature of the obstruction, must surely give more confidence in the efficacy of the external incision. We have not space to follow the author in his description of the anatomy of femoral hernia, and which, indeed, essentially resembles that furnished by Cooper.—*B. and F. Med.-Chirurg. Rev.*, April, 1857, from *Vierordt's Archiv.*, 1856.

47. *Herniotomy in an Infant seven weeks old.*—Mr. Wm. Rayner records (*Lancet*, April 4, 1857) a case of strangulated irreducible hernia of the right side in an infant seven weeks old, attended with stercoraceous vomiting, in which he successfully operated.

48. *Ovarian Dropsy treated by Iodine Injection.*—Dr. J. B. Brown related to the Medical Society of London, the following case of this: J. S., aged 40, was admitted into Boynton ward on the 5th of March, 1857, under his care. When eighteen years old, she perceived her abdomen to become more swollen (but without pain), which gradually increased until she was twenty-five, when she was tapped, and between seven and eight quarts of clear fluid taken away. It has since then gradually filled, and produces great uneasiness by its pressure. General health good. On the 11th of March, at 2 P. M., he (Mr. Brown) tapped in the semilunar line, and drew off sixteen pints and a half of straw-coloured fluid, slightly albuminous. He then injected six ounces of the Edinburgh tincture of iodine into the cyst; it caused no pain. At half past eight the same day, iodine was found in the vomited matter, and large quantities in the urine. On the 12th, she was very sick and prostrate, and was ordered to take stimulants freely. On the 13th, she passed a restless night. From this period she gradually recovered, without any untoward symptom, and left the hospital quite well, and daily gaining strength.

Dr. Gibb had seen five cases in which the iodine injection had been used. In three instances it was successful; one had died from peritonitis, and the other was sinking. In all the five cases the tincture of iodine of the Edinburgh Pharmacopœia had been used.—*Lancet*, May 16, 1857.

OPHTHALMOLOGY.

49. *On the Employment of the Ophthalmoscope in the Investigation of Deep-seated Disease of the Eye.* By Holmes Coote, Ass. Surg. to St. Bartholomew's Hospital.—The difficulties so often experienced by the surgeon in determining the exact seat or nature of the different diseases affecting the structures of the eye posterior to the iris, render any discovery acceptable by which diagnosis may be facilitated; and hence the ophthalmoscope, which illuminates the interior of the globe and brings before the observer morbid changes in the choroid coat, or in the retina, heretofore unknown, is attracting at the present moment particular attention.

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Before proceeding to describe some of the cases in which important information is gained by the use of the ophthalmoscope, I may remark that the usual depreciatory cry of obstructive mediocrity has been already raised against this as against every other novel instrument, either in medicine or surgery. We are told that the employment of the light injures the eye; that it shows nothing; that what it does show, cannot be rectified. I have often remarked to you that a precisely similar cry was uttered of the stethoscope, the early general employment of which is quite within my professional recollection. The same enlightened remarks will be made on the next discovery of a similar class, but experience proves that they do not affect the ultimate success of that which is true.

I apprehend that one great advantage likely to result from a more accurate knowledge of the pathology of the deep-seated affections of the eye, will be to connect ophthalmic surgery more closely with general medicine; to render it less a speciality; and to establish far more scientific and well-grounded principles of constitutional treatment. Already have the consequences of scrofula, gout, rheumatism, syphilis, and Bright's disease of the kidney, on the sight, been recognized; but we want the first step in the further inquiry—namely, the nature of the morbid changes in the affected organ.

Syphilitic iritis is a disease which is generally very easily controlled by proper treatment; namely, the abstraction of blood and the administration of mercury. Occasionally, though rarely, patients do not bear bloodletting. In other cases, mercury is inadmissible from the beginning; or, at some latter period, when other medicines have to be substituted. But at the same time, let it be remembered, that iritis may run its course without treatment, and leave the patient very useful vision.

A case which, after the subsidence of the active disease, leaves the patient with vision impaired for a month or six weeks, but slowely progressing to complete recovery, affords useful matter for ophthalmoscopical investigation.

A young man was under my care in St. Bartholomew's Hospital, suffering from acute syphilitic iritis, in the month of September, 1856, having neglected himself for a fortnight previously. His disease yielded to the usual treatment, but left him with a mist before his sight, which was unfit for any occupation requiring minuteness. I examined this patient with the ophthalmoscope early in January, 1857, with the expectation of finding traces of inflammatory deposit in the choroid membrane. In this, however, I failed ; but behind and to the side of the crystalline lens, and in the vitreous humour, there were opaque membraniform deposits, which prevented the ready transmission of light. Experience had taught me that ultimately the eyes would recover themselves; and I expressed myself to that effect in confident terms to the patient. He presented himself at the hospital on March 12th, when his vision was as perfect as ever. The morbid deposits had disappeared.

Dr. Heymann, of Dresden, remarks, that in iritis two forms of morbid deposit are noticed. 1. A sparing exudation from the iris, but with turbidity of the aqueous humour. 2. Frequently recurring hypopion. In the first form, the opacities in the vitreous humour were fine, filamentous, or membranous, and depended upon inflammation of the ciliary bodies, and perhaps of the anterior part of the choroid. In the second, it was seen that the vitreous humour was turbid, the choroid coat redder than usual, and studded with yellow inflammatory deposits. The veins of the retina were very dark and dilated. In this form of the disease, the vitreous humour may be occupied by a network of lymph.

The influence of Bright's disease, or granular degeneration of the kidney upon the organs of vision, is becoming daily a subject of greater interest. The drawing which I here present was taken from an amaurotic patient of intemperate habits. The papilla of the optic nerve is swollen; the branches of the central vessels of the retina are less visible than natural; there are small and distinct deposits of lymph about the choroid membrane. Of the history and progress of this case, I unfortunately know nothing.

Landouzy is said to have first published an account of the connection between Bright's disease and amaurosis. But Blodig found only three cases in illustration of this combination during the five years he studied in the ophthalmic clinic of Vienna.

At Dresden, Dr. Heymann found in an eye of a patient so diseased: 1. All the transparent structures normal; 2. The choroid of its usual vascularity; but the papilla of the optic nerve was twice its normal size.

In a second case, the vitreous humour was found to be turbid.

In a fatal case, the following *post-mortem* appearances were observed: Upon division of the globe, the vitreous humour did not flow out, but clung to the anterior and the posterior sections. The anterior part of the choroid showed deficiency of pigment in the choroid, corresponding to external blue discoloration during life. In the posterior segment, the macula lutea was abnormally marked. About one or two lines from the entrance of the optic nerve, which was natural, there was a ring of yellowish white deposits, about twenty in number. By the aid of a magnifying glass, other and smaller spots were seen in the neighbourhood. The microscope showed that these spots were instances of granular fatty degeneration of the retina, which separated more easily than natural from the choroid.

Seventeen years ago, long before the microscope was in general use or the ophthalmoscope invented, the following case came before my notice :—

Thomas P., aged 22, a printer and compositor, a man of intemperate habits, was admitted into St. Bartholomew's Hospital, under Mr. Lawrence, with amaurosis, considerably advanced in both eyes. The sight had been gradually failing for the last four months, but without heat about the temples or pain in the head. There had been no dark spots or muscæ volitantes. The pupils moved sluggishly upon exposure to light, which, however, caused no pain.

Feb. 23d, 1840. Five grains of blue pill were ordered to be taken thrice a day. He was cupped from the neck to ten ounces.

Feb. 24th. He stated to-day that he had of late suffered much pain from swelling of the legs, which he attributed to his constant habit of standing. He was suffering from bronchitis of both lungs.

March 1st. He died of the disease of the chest.

Examination of the Eyes after Death. The external appearance of the organs was natural. The optic nerve was unaltered in appearance, perhaps flatter than usual; the transparent structures were healthy, but near to the optic papilla in both eyes there was an extravasation of blood in the retina visible to the unassisted eye.

The bronchi were full of secretion; the lower part of the lungs was consolidated.

The abdominal viscera were not minutely examined.

I believe that this was a case of Bright's disease, and that in consequence, those granular changes occurred in the arteries of the retina, which Virchow has described as common under such circumstances in the capillaries of the brain.

Sufficient has here been said to show the importance of further investigations upon the subject.—*British Med. Journ.*, March 28, 1857.

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50. *Sympathetic Inflammation of the Globe.*—Dr. R. Bell, in his quarterly report of cases occurring at the Edinburgh Eye Infirmary, makes the following interesting remarks on this serious accident.

"It has long been known to those who are familiar with diseases and injuries of the eye, that when one of these organs has suffered severely, its fellow is very prone to participate in the inflammatory action. This has been noticed particularly in cases of serious injury, so that an unfortunate individual with the sight of one eye completely or partially destroyed, we shall suppose, by a stray pellet from a fowling-piece, by an explosion of gunpowder in blasting, by a small fragment of steel from the anvil, or some analogous accident, incurs a very great risk of losing, at no distant period, his remaining, and now doubly-precious vision, by destructive inflammation lighted up in his other eye. The sympathetic disease thus kindled is seldom very acute; but unless arrested by prompt and appropriate measures, it sooner or later completes its work of hopeless disorganization. The following case, which occurred to us lately, and of which the issue has been more favourable than there seemed any reason to expect, may be adduced, both as an example of the class referred to, and as affording an illustration of the treatment sometimes, although seldom, beneficial.

"Mrs. S., a healthy-looking person, forty-one years of age, applied for advice on the 20th of January. About five weeks previously, she had severely injured her left eye, by striking it in the dark against the handle of an outer door. Her vision was gone, and this seems to have been the case almost from the moment of the injury. The *iris* had been lacerated from the pupil to the ciliary margin at its outer side, and at the same time extensively torn from its attachments in an upward and outward direction. She mentioned that, although inflamed and painful for some days, the eye thus sadly damaged soon got into a comparatively quiet state; but that, during the last two weeks, the right eye had caused her much anxiety from the vision undergoing a gradual impairment, to such an extent that she could barely distinguish one person from another, or even find her way along the streets. Upon examining the right eye thus secondarily affected, we could discover little or no vascularity, but it had lost all expression, the pupil being greatly dilated and immovable. Leeches were applied several times to the lower lid, and mercury prescribed in small but regular doses. No benefit was observed, but rather the reverse, until on

the 11th of February, eight weeks after the accident, her gums became tender, and a simultaneous improvement took place in both eyes. On the 2d of March, a gentle mercurial action having been continuously kept up, she could distinguish objects of moderate size, such as small phials and boxes on the mantelpiece, with the eye originally wounded, while with the other she was able to read type of large size, and to tell the hour on a watch with a white dial-plate; but the pupil still continued large and sluggish, and on looking towards the sky, she was sensible of a number of small dark objects dancing as it were in the field of vision.

"*March 12th.* The right eye is regaining its expression, the pupil being smaller and more movable; and she can now read with tolerable facility the smallest print on our dispensary card. This progressive improvement indicates the propriety of persevering with the one-grain doses of blue pill, which she has been taking twice daily, although there has been very little tenderness of the gums. We anticipate that the power of vision in the right eye will eventually be nearly perfect.

"In the foregoing case, the injured eye passed at an early period into a comparatively quiet and easy condition, although vision appeared to be almost totally destroyed; but had the globe continued inflamed and painful, it is very doubtful if any remedies would have succeeded in saving the other eye. Under such unfavourable circumstances, namely, one eye inflamed and useless, and the other beginning to sympathize, two proceedings have been suggested and carried into effect: both of them, in certain cases, with encouraging success. The principle upon which they are severally founded is the same; that of thoroughly removing the source of irritation which exists in the eye originally injured. The first of these operations, regarded by some as the least formidable, consists in cutting off the front portion of the eye, as in the common operation for staphyloma, and allowing the lens to escape. The wound thus made speedily contracts and closes, leaving the globe free from irritation and considerably smaller in its dimensions, but suitable at a later period for the adaptation of an artificial eye. The second operation consists in removing the entire globe in the manner recommended many years ago by Dr. Ferrall,[1] of Dublin. Instead of emptying the orbit of its contents, we divide *seriatim* the attachments of all the muscles by which the eyeball is surrounded; when the latter is readily dissected from its cellular sheath and the optic nerve cut across. If properly performed, this operation is followed by little or no suppuration; and the textures behind being left undisturbed, the danger, either at the time or afterwards, is very trifling. When the globe is thus entirely removed, there might seem to be an unfavourable condition of parts for the subsequent use of an artificial eye; but this objection is more theoretical than practical.

"Both of these procedures have their exclusive advocates; but we consider them both to be good, and applicable to a large number of cases, although one or other may be preferable under special circumstances. The two cases which follow, may be related as examples.

"J. D., eighteen years of age, the son of a soldier, spent most of his childhood with his father's regiment in India, and has latterly, for some years, been thrown very much on his own resources, and exposed to many hardships and privations. He is nearly quite blind; and having no better way of livelihood than that afforded by hawking small wares in a basket, he has the appearance of being inadequately fed and nourished. Very early in life, he suffered severely from ophthalmia, probably purulent, in both eyes, and has been liable ever since to frequent exacerbations and great tenderness. The right cornea is highly vascular, and quite impervious to light, and, at the same time, so extremely irritable, that the gentlest attempt to expose and examine it by separating the lids causes a profuse discharge of tears. The left cornea is very

[1] Dublin Journal of Medical Science, July, 1841. This gentleman is generally called O'Ferrall by those who quote his very important and suggestive paper, but on referring to the original source, we find no trace of the prefix.

nebulous, and permeated extensively at the upper half by distinct red vessels. The conjunctival lining of both superior palpebræ is decidedly granular.

"This was his condition at the time of his first visit.

"Under the use of the solution of diacetate[1] of lead pencilled upon the granular conjunctiva, and the *pulv. cinchonæ* with dried carbonate of soda internally, a great improvement took place in the left eye—the opacity of the cornea gradually clearing away and useful vision returning; but the right eye underwent little or no change for the better, and continued to be a source of abiding irritation. It was seldom free from more or less inflammatory action, which the slightest exposure would aggravate to a distressing and discouraging degree. All the ordinary remedies having failed to allay and prevent this obstinate irritability, and the organ itself, so far as vision was concerned, being altogether useless, it seemed necessary to adopt some decided measure, with the view not merely of removing a vexatious source of pain and discomfort, but of saving the other eye from that sympathetic inflammation, which we know by experience to be too often beyond the reach of remedies. In this case, we preferred the less formidable operation of removing the cornea and crystalline lens, as likely to be equally effectual with the other procedure, to which we have alluded, of excising the entire globe. The patient being brought under the influence of chloroform, the upper half of the inflamed cornea was divided, as for extraction of the cataract; the crystalline lens escaped, and then, the flap being raised, the remaining half of the cornea was easily removed by means of curved scissors. The wound healed without any untoward occurrence, and the young man went home free from pain, and with so much improvement in the sight of his remaining eye, that he now aims at learning some useful occupation.

"W. J., a young woman of eighteen, had severe and obstinate ophthalmia in early childhood, which not only deprived her almost entirely of sight in the left eye, but caused very considerable deformity. When she applied for advice at the Eye Infirmary, a few months ago, the cornea was staphylomatous and opaque, and presented over one-half of its area a red, vascular, almost fleshy appearance, caused evidently by inflammatory thickening of the conjunctival lamina. The eyelids were red and tender; the lower slightly everted. All these morbid changes constituted an abiding source of irritation, which made the other eye weak and watery; so that the patient was very desirous that something should be done for her relief. The movements of the globe were in unison with those of the sound eye; but, as already mentioned, vision was gone, with the exception of a bare perception of light. Under these circumstances, there could be no doubt as to the propriety of an operation; but whether the globe should be removed entirely, or merely the projecting staphyloma, was a question admitting of a difference of opinion. We decided in favour of excising the eyeball, from observing that there was a decided enlargement of its posterior part, which made it doubtful if the mere cutting off of the staphyloma would induce a sufficient contraction of the organ after the wound had healed. The globe was accordingly removed by dividing the various muscles in succession, in the manner previously described. The healing process advanced very favourably, unattended by much suppuration, and the young woman is now able to wear an artificial eye, without pain or inconvenience."—*Edinburgh Med. Journ.*, May, 1857.

51. *Loss of Vision following the blow of a whip; recovery.*—E. N., aged 25, was admitted into St. Bartholomew's Hospital, under the care of Mr. Lawrence, on account of a blow across both eyes from the lash of a whip received six days before his admission. The blow had caused very severe pain: he fell to the ground, and was picked up unable to see at all. In a few hours, however, he recovered sufficient vision in the left eye to follow his occupation (that of a drover) for a few days. The right eye, however, continued blind, and he suffered much from pain across the brow on that side. On admission, the only

[1] *Vide* Edinburgh Medical Journal, November, 1855.

morbid appearance noticed was that the right pupil was dilated and fixed, and the cornea surrounded by a faint vascular zone.

The treatment consisted in taking blood by cupping on the temple, and the administration of mercury to salivation. As the mercurial agency became established, improvement in vision commenced and progressed steadily, and he left the hospital, with very fair vision, on the twenty-third day.

Remarks.—In this case the loss of vision was probably due to the cause vaguely spoken of as "concussion of the retina," a morbid condition, the precise anatomical nature of which is ill understood, and no doubt varies much in different cases. From the rapid and decisive improvement which followed the exhibition of mercury, it may be conjectured that in this instance there was some inflammatory exudation following a disturbance in the circulation of the retina, analogous to that which has been observed in the cerebral circulation in cases of concussion of the brain, and which produces those minute extravasations described by several English and French writers. As a contrast to the above, we shall briefly cite another case, in which the lesion to the deeper parts was of a more permanent character, and the loss of vision irremediable by medical treatment. In this no antiphlogistic means were indicated, and nothing remained but to watch the progress of the case, in the hope (which, however, was not realized) that the absorption of the effused blood might be followed by partial recovery.—*British Medical Journal*, March 14, 1857.

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52. *The Relation of Cataract to Heart Disease*—Mr. T. F. Jordan, Demonstrator of Anatomy at Queen's College, Birmingham, has published (*Brit. and For. Med.-Chir. Rev.*, April, 1857) a series of nineteen cases in support of the proposition that non-traumatic cataract is frequently associated with, and in many instances may fairly be regarded as a result of, cardiac impairment.

A fair examination of these cases justifies, he thinks, the assertion "that heart disease is in numerous instances found in conjunction with non-traumatic cataract, and that consideration of the history of the cases where it is found warrants us to look at it in the light of a cause. It cannot be presumed that the heart disease is a product of the same cause which induced the cataract, because then some other and prior cause of both would need to be eliminated. Such cause it would be difficult to demonstrate. No cause of cataract is known, unless heart disease be admitted to act as such. That admission being made, the causes of heart disease are numerous and undoubted.

"The questions which now most naturally arise are these: What extent of heart disease shall favour the development of a cataractous opacity? Is there any particular lesion of the heart which, more than another, predisposes to the affection in question? The cardiac disease exists only in a slight degree—a degree, however, unmistakably appreciable, whether we consider general symptoms or physical signs. The cardiac impairment is indeed so limited, that old age in cataractous patients is a familiar phenomenon to the ophthalmic surgeon. Nor does the true explanation of this circumstance rest on the inference that old age is itself a cause of cataract. A large number of cataractous patients are not old. In one-third of the above cases, the age is between forty and fifty, while two of the cases are under twenty years.

"It being presumed that cataract is a gradual degenerative change in the crystalline lens from a partially impaired heart, it is natural to infer that the causes of so limited lesions would accumulate in old people—in other words, that younger people would be cut off by more extensive lesions, either of the heart or other organs.

"Sudden death is not unknown in cataract—occasionally as the mortifying result of an operation; but so exceptional is it, that where so extensively a diseased heart is found as to render either death probable or life uncomfortable, cataract is one of the results least to be expected. Hence one common cause of cardiac mischief—Bright's disease—is unknown in cataractous cases, clearly because Bright's disease leads to other and graver results. Rheumatism, which may leave only slight impairment of the central organ of circulation, we have already seen to be a frequent incident in the history of cataractous cases; pos-

sibly in the same category with rheumatism, future research may include influenza, scarlatina, smallpox, and the various fevers.

"In reply to the second question—'Whether any particular lesion of the heart more than another predisposes to the affection under consideration?' a negative would seem the more correct reply. Cataract obeys the general law which regulates for the most part all the secondary results of heart disease—namely, that the result is determined rather by the amount than by the precise locality or nature of the abnormal condition. Of course, the infinite rarity of disease of the right side of the heart is understood. In the above cases, slight mitral regurgitation is the cardiac infirmity found in the greater number of cases. In some of the cases, the mitral and aortic orifices were both partially implicated; in one or two, the aortic only. In several of the cases, a fatty condition of the heart might be reasonably predicated. It will be seen that an extended præcordial dulness, without a proportionate increase of the heart's impulse, was a not unfrequent phenomenon. Hereditary heart disease was found in more than half the cases where the hereditary tendency could be discovered. In case No. 19, there had been a chest injury, evidently implicating the heart.

"It is an undoubted disadvantage that the foregoing conclusions have not, from entire absence of opportunity, received the confirmation of *post-mortem* dissection. But such additional proof, while desirable, is not absolutely essential. A morbid sound is assuredly an appreciable phenomenon, and cannot exist without a cause.

"Let us turn now for a moment to the collateral evidence confirmatory of the inferences above drawn. It has already been stated that the results of considerable cardiac lesion are not present, and cannot be expected to be present, in cataractous cases. The less grave symptoms, however, are frequently obvious—as vertigo, tendency to faintness, dyspnœa, palpitation. Those, too, who have mixed much with cataractous patients, must have observed frequently the peculiarity of their mental states—states not rarely found associated with heart disease. Extreme loquacity on the one hand, and obstinate taciturnity on the other, are psychological indices by no means rare. Nor are these results mere accidental sequences of blindness—they are not found in the blindness occasioned by injuries.

"Probably much light may yet be thrown on the pathology of cataract by future microscopic examination of the opaque lens. In one opportunity I have had of examining a non-traumatic cataractous lens, the microscope revealed fat globules in the nuclei of the delicate cells covering the surface of the crystalline lens, and here and there a few delicate plates of cholesterine might be detected. May not cataract be the result of a process identical with or analogous to that of fatty degeneration? That fatty degeneration of a portion of the lens may exist, is proved by the researches of Drs. von Ammon and Schön, as quoted by Dr. Mackenzie. The former found, in cases of arcus senilis, a fatty arcus on the corresponding margin of the lens. Dr. Schön has found both the lens and posterior capsule affected with fatty degeneration."

[Our own observations have not led us to suspect this relation between cataract and heart disease, but the subject is well worthy of investigation, and now that attention has been drawn to it, it is to be hoped that the conclusions of Mr. Jordan will be carefully examined.]

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53. *Ought both Eyes, when Cataractous and equally affected, to be Operated on at the same time?*—Mr. Mackenzie, in his valuable work, states that his experience leads him to answer in the affirmative to this question, "if division of the cataract is the operation to be performed; but if we mean to extract, I regard it as better to operate on one only, and watch the result before touching the other. Double extraction decidedly exposes the eyes to greater risk of inflammation. If we operate only on one eye and allow it to recover, we may possibly observe in the course of the operation and recovery some particulars which will be essentially useful to us in conducting the second operation, or will even lead us to select a different and more suitable mode of operating for the second eye. The patient, however, who has recovered from a first opera-

tion either well, or indifferently, or ill, is often unwilling to submit to a second. The confinement, abstinence, and depletion, used after a fresh operation, sometimes cause the eye not operated on to fall so much back in the orbit that it is difficult to perform extraction on it."

Dr. JOHN SLOAN, house-surgeon to the Leicester Infirmary, has lately offered (*British Med. Journ.*, May 2, 1857) some sensible remarks in relation to this question.

"I attach," he says, "great value to any statement of Mackenzie's regarding ophthalmic surgery; but I believe, and I hope to be able to prove to you, that his opinions concerning the double extraction are erroneous. Every one who has seen many cases of disease of the eyes, must be aware of the great sympathy that exists between them, and I was taught to consider the extraction of both lenses at one sitting a most hazardous proceeding, inasmuch as if inflammation came on in one eye, the other would most probably become affected by sympathy, and that it was therefore advisable to allow some months to elapse between each operation. Being a firm believer in this doctrine, I was astonished and instructed by the following cases.

"John Wood, aged 59, a framework knitter, had double extraction performed by Mr. Paget, on the 18th of January, 1856. One eye became violently inflamed and vision in it was lost, but in the other no unfavourable symptom appeared, and on the 4th of March he was discharged, able to read pretty well with the assistance of a proper glass. This case is published in detail at page 246 of the *Association Medical Journal* for 1856.

"The next was an aged female inmate of the Leicestershire Lunatic Asylum, who had double cataract, and whose mental aberration was believed by Dr. Shaw and Mr. Buck to depend in a great measure upon the loss of sight. Mr. Buck, after a consultation with Mr. Paget, and assisted by him and myself, extracted both lenses by the double operation. I do not possess notes of the case, but I learned from Mr. Buck that one eye inflamed, suppurated, and vision in it was lost, but that the other progressed favourably, and she could see with it satisfactorily.

"According to the views I formerly held, vision should have been lost in both eyes in each of these patients. It cannot be doubted that after a single operation inflammation would as readily have arisen, and loss of vision been the result in the eye which did badly, as after the double extraction; and as the untoward symptoms were confined in each case to one eye, the other not being sympathetically affected, no mischief was caused; on the contrary, it was fortunate for these patients, at least for the sane one, that the double operation was performed; because, had one eye been operated on in the orthodox mode, and that one happened to do badly, the man probably would never have consented to a second operation; and at this moment, instead of enjoying the power to read pretty well, he would have been helplessly blind.

"My observations upon these two cases alone did not induce me to renounce my old notions. I learned from Mr. Paget that his father, whom he succeeded in the office of surgeon to the Infirmary, always performed double extraction; that he himself has always followed the same plan; and their combined experience extends over a period of sixty years. I have been told that his late colleague, Mr. Nedham, did, and I know that his present colleagues, Messrs. Macaulay and Benfield, do, extract cataractous lenses by the double operation. These gentlemen are convinced that the greater risk of inflammation after double extraction is a myth—a plausible hypothesis not founded on facts; and the truth of which I believe has not been previously questioned in this country. In no other hospital in the United Kingdom, as far as I have been able to ascertain, except at the Leicester Infirmary, and at the Birmingham Eye Institution since its foundation in 1823 by Mr. Hodgson, is it the rule to resort to double extraction. I know that it has been adopted occasionally by surgeons elsewhere; and it may be argued that if it had been found to be safe it would have become the usual practice long since. But this argument would be unjust; because, if this plan has not succeeded in patients under the care of other medical men, it must be on account of some difference in the mode of operating or in the after treatment, and it only shows the necessity for them

to discover and to remove this difference, and then there can be no reason why they should not obtain results as satisfactory as have been obtained at the Leicester Infirmary. I should state that the late M. Roux always performed double extraction.

"'That we should only operate on one eye and allow it to recover; as we may possibly observe, in the course of the operation and recovery, some particulars which will be essentially useful to us in conducting the second operation, or will even lead us to select a different and more suitable mode of operating for the second eye,' is a reason assigned by Mackenzie for preferring the single operation. Are we not more likely to remember and be prepared to meet any peculiarities or difficulties encountered in operating on the first eye, if we proceed to operate on the second after a few minutes, instead of delaying for some months? We are not obliged to extract the lens from the second eye in the double operation, if after operating on the first, any other procedure be considered preferable; and I cannot see the propriety of watching the progress towards recovery of one before the other is touched, as, according to my observations, these cases do not take an unusually erratic or uncertain course, but the sequence of events in one patient closely resembles that in another, and we cannot be certain that the progress of the second eye will be similar to that of the first; on the contrary, it is more likely to be different, because after some months the patient's general health is likely to be somewhat changed, and the state of the second eye is occasionally altered materially.

"I have now considered all Mackenzie's objections to double extraction. I confess I am unable to assign any reason why he should recommend the double operation for solution, as inflammation is one of the complications to be dreaded, and the wisdom of waiting some months to remember the particulars of the first operation, which will aid us in the second, will apply equally well to division as to extraction. It appears to me that if it be right to perform a double operation for solution, it is equally right to perform double extraction. Double and single extraction being equally free from danger, what are the special advantages of the double operation? The patient is only for half the time confined to his bed and to his room, and stinted in his diet; there is not the same risk of his remaining with imperfect or without vision, because if the first operation succeed well, or even indifferently, he will not unlikely be satisfied with what he has gained, and fearing the risk, refuse to submit to a second; or if extraction on the first eye fail, he would probably refuse to have the second operated upon; and we must not forget, as already stated, that 'the confinement, abstinence, and depletion, used after a first operation, sometimes cause the eye not operated on to fall so much back in the orbit, that it is difficult to perform extraction on it.'"

MIDWIFERY.

54. *Puerperal Fever.*—Prof. Murphy read before the Epidemiological Society of London (March 2d, 1857), the concluding portion of a paper on this subject. The author alluded to a former paper on this subject, in which he objected to the propriety of considering this disease as an inflammation of one or other of the tissues. He then pointed out, that neither in the mode of the attack, in the symptoms, in the post-mortem appearance, nor in the treatment, did puerperal fever agree accurately with peritonitis. A closer resemblance to phlebitis was admitted, because both were blood diseases, but he denied that they were identical. He proceeded to explain his views of the nature of the disease, that it was the result of a poison, and obeyed strictly all the laws of morbid poisons. *Its action was definite and specific.* The seat of that action was the serous surfaces, especially the peritoneum and uterine veins, chiefly because of the rapidity of their absorption. He denied that the action itself should be considered a *specific* inflammation, although he admitted that in cer-

tain cases inflammation may be excited. The term inflammation was used too extensively, being made to embrace actions perfectly opposed to each other. The design of inflammatory action is to preserve or repair organized structure, yet the term is given to actions that destroy it. Thus, cancerous inflammation, tubercular inflammation, are expressions sometimes used in such a manner as to mean that cancer and tubercle were only forms of inflammation. So, also, in the infantile lung, post-mortem appearances were described as lobar, lobular, vesicular pneumonia, which were caused by collapse of the lung. The tendency of a poison is to destroy organization; it is incorrect, therefore, to consider its action as a *specific* form of inflammation, which, whenever it takes place, is only for the purpose of limiting the action of the poison; and in this sense, just as the deposition of tubercle on the peritoneum is accompanied by peritonitis, so the puerperal poison may excite peritonitis; but the more powerful the poison, the less peritonitis; and the weaker its influence, the more distinctly are the evidences of inflammation observed. The action of the puerperal poison is on the blood; the quantity of fibrin is increased; the quality deteriorated; a profuse exudation of morbid fibrin takes place, having none of the properties of healthy fibrin, it is not organizable; dissolves into a creamy substance, which melts into a fluid like pus, and, mixing with serum, forms the abundant "lactescent fluid" of authors. Exudations are not found in the veins, because they are not adhesive, but dissolved fibrin, like pus, is found abundantly. The puerperal poison seems a contrast to the typhus poison, which destroys fibrin, yet the typhus poison, absorbed by a parturient patient, will cause puerperal, not typhus, fever. It is the same with erysipelas. *The action of the poison is modified by the dose, as well as by the temperament and constitution of the patient.* Puerperal fever does not attack all indifferently, but selects its victims. The most important feature of this law is the manner in which the characters of the disease are modified by the quantity of the poison absorbed. When it is in excess, the patient may die without any other symptoms than a fluttering pulse and cold, livid surface. On the other hand, the dose may be so small, that true inflammation is set up to arrest it, and thus peritonitis, phlebitis, or arthritis takes place. Hence the contradictions amongst authors, those who meet the latter class of cases calling the disease peritonitis, &c., while those who witness the former stand aghast at symptoms which no theory of inflammation can explain. The co-existence of hooping-cough and measles, of syphilis with erysipelas, proves that two morbid poisons may each set up their specific actions in the same person at the same time. Erysipelas and puerperal fever have occurred in the same patient; but the author generally found erysipelas to precede or follow puerperal fever rather than accompany it. Erysipelas excited puerperal fever; but when the latter was at its height, the former disappeared. The author objected to the opinion that erysipelas and puerperal fever were identical, and did not consider those cases described by Gooch, in which the peritoneum was pale and colourless, as puerperal fever at all. They might be instances of erysipelas, if this poison ever attacks serous membranes. The author considered the poison as a contagion just like the cadaveric poison, which seems so similar to it; and briefly enumerated the symptoms of the disease to explain the principle which should guide us in the treatment. According to its strength, the constitution makes an effort to get rid of the poison, whether by vomiting or by purging, by the skin, or by the kidneys. The observation of these efforts led Donat to use emetics; Boër kermes mineral; Denman tartar emetic; and Armstrong salts and senna. If the effort fail, the poisoned blood accumulates at the centres of the circulation, which are relieved by a prompt and bold depletion; for such a purpose, thirty, forty, even fifty, ounces of blood have been taken with decided benefit; but depletion should instantly follow the rigor, because if time is lost, the very same treatment may only hasten dissolution. Camphor and turpentine have been recommended in the treatment of this fever. These remedies are not only stimulant but anæsthetic, and are useful not alone in supporting the constitution against the attack, but by diminishing pain, they lessen nervous exhaustion. Reasoning on these facts, the author tried chloric ether with great advantage, and recommended it strongly to the consideration of the profession.

General rules cannot be laid down for treatment. If the dose of the poison be a maximum, nothing will save the patient; if in such quantity that the constitution can make some effort to get rid of it, much of our success will depend upon a close observation of the manner in which the effort is made. Prompt depletion has saved many a patient. The judicious use of emetics, purgatives, diaphoretics, and even diuretics, has averted the attack by aiding a natural effort. If the dose of the poison be a minimum, then peritonitis, or phlebitis, becomes prominent, and must be treated as such. Thus what are called the inflammatory and ataxic forms of this disease, merely signify the degrees in the dose of this poison. The author alluded to the importance of prophylactic agents, to *ventilation* and the improvements lately introduced, to chlorine as a means of destroying the poison, and to anæsthetic agents as a means of blunting the sensibilities of the nervous system and diminishing the activity of absorption. In this sense he considers chloroform extremely valuable; and so far from fearing its influence in causing puerperal fever, he looked upon it as a preventive.—*Lancet*, March 28, 1857.

55. *Saccharine Urine in Nursing Women.*—The presence of sugar in the urine which has heretofore been regarded as a pathognomonic sign of the disease Diabetes, would appear, from the researches of M. Blot, to be deprived, to a certain extent, of its value in the diagnosis of this disease. This gentleman, in a paper which he has recently laid before the Imperial Academy of Sciences, states that sugar is *always normally* present in the urine of women in childbed, in that of nurses, and occasionally in that of pregnant women. M. Blot, after having satisfied himself by a chemical examination of the presence of sugar in the urine, proceeds to state the following facts, as the result of his investigations upon this interesting subject.

In all women in childbed M. Blot found that it was at the moment of the lacteal secretion that the sugar first makes its appearance in the urine, in sufficient quantity to be well determined; however, in some cases it may appear before this period, in which case it is however generally present in small quantity. The amount of sugar present in the urine is exactly in proportion to the activity or slowness of the lacteal secretion, for when this is abundant the quantity of sugar found in the urine is great, but if, on the contrary, the secretion is not so, then there will be less sugar detected in the urine; from this we might, as M. Blot remarks, judge of the value of a nurse by an examination of the urine.

If it should happen that the lacteal secretion is diminished or retarded by disease of any kind, the sugar diminishes, or completely disappears from the urine; but as health is restored, and with it the lacteal secretion, it again makes its appearance.

The quantity stated by M. Blot as being present was 8 grammes in 1000 grammes, in the case of a nurse who had suckled for 22 months. Of the women whose urine was examined, whether in childbed, nurses, or pregnant, none presented any symptom whatever of diabetes; on the contrary, their urine was found to be richer in sugar in proportion as their health was good.

When the secretion of milk ceases, the sugar disappears, but in a variable time in different cases; thus it does so quicker in those women who do not suckle, and slower in those, who, having suckled, commence to wean. In these latter the sugar is alternately present, for it was found one day, absent the next, but it again made its appearance upon the third. The proportion of sugar is generally much less than what is found in diabetes; from 1 to 2 grammes up to 12 grammes in 1000 grammes, is about the proportion stated by M. Blot as being correct; it may, however, be right to state that this proportion of sugar was found in urine of the morning. In pregnant women sugar was found present in the urine in about half of those examined.

This saccharine state of the urine of women, which appears from the researches of M. Blot to be constantly under certain circumstances normally present, will probably also be found to be the case with the females of different species of mammiferous animals, as M. Blot has already detected sugar in the urine of the cow in 9 cases which he examined.

The author of this paper has promised to prosecute his researches upon the females of mammiferous animals, for the purpose of ascertaining whether the same takes place with them as has been shown to occur in women. M. Blot will lay before the Academy a paper in which he will state the result of his investigations, which will, without doubt, be of great interest to the physiologist.—*Med. Times and Gaz.*, Nov. 22, 1856.

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56. *Iodine in Vomiting in Pregnancy.*—Dr. J. B. Schmitt some time since recommended the tincture of iodine in the vomiting of pregnant women, when this may be regarded as a neurosis. He gives one case in particular, in which a woman, who had, in consequence of vomiting, had four abortions, and became pregnant with her fifth child. Two drops of the tincture given every two hours completely kept the vomiting under, as long as it was continued, the vomiting only returning when it was suspended. At last, a dose two or three times daily sufficed. Dr. Eulenberg has also met with a remarkable case in a healthy woman, 35 years of age, who had suffered from sickness in every pregnancy, and on this occasion had become much reduced. As she was very susceptible to the action of medicines, he ordered her—tinct. iod. ℈j, sp. vini r. ℥iij, 3 drops to be taken in water every three hours. By the second day all the most distressing vomiting had disappeared, and she was again able to keep water on her stomach, and in a short time she quite recovered. The *modus operandi* of such small doses of the tincture is not very easily explained; but it is to be observed, that the iodide of potassium exerts scarcely any influence. It is highly probable that it only influences the vomiting, inasmuch as this is a neurosis, an abnormal condition of the nerves of the stomach. In proof of this, it is also administered with the greatest advantage to hysterical women suffering from abnormal sensations at the epigastrium as an insupportable feeling of emptiness, or a constant feeling of hunger without appetite. The iodine acts beneficially in the sympathetic nervous irradiations, even when not connected with pregnancy, but which may depend on suckling, etc. The cardialgia and nausea of pregnancy are speedily relieved by it, as well as the vomiting.—*Med. Times and Gaz.*, Nov. 22, 1856, from *Berlin Medicin Zeitung.* No. XXV.

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57. *Sterility.*—Dr. Carl Mayer gives the following statement of the pathological examination of 272 sterile women.

In 2, no uterus.
" 60 } 97 { anteflexions.
" 37 } { retroflexions.
" 35 } 38 { anteversions.
" 3 } { retroversions.
" 42 inflammatory irritations of the outer genital organs and os vaginæ; and amongst these, in fourteen women long married, an unbroken hymen.
" 51 chronic endometritis.
" 25 chronic oophoritis.
" 23 ovarian tumours.
" 12 uterine polypi.
" 6 fibroid tumours of uterus.
" 9 hypertrophy of uterus.
" 1 elephantiasis of outer genitals.
" 6 women, no pathological condition of genitals was found.
" 16 anteflexions—1, irritation of pudenda; 4, endometritis chronica; 5, oophoritis chronica; 3, ovarian tumours; 1, polypus; 2, hypertrophy of uterus.
" 13 retroflexions—1, irritation of pudenda; 6, endometritis chronica; 2, oophoritis chronica; 2, ovarian tumours; 1, fibroid tumour; 1, elephantiasis of pudendi.
" 10 anteversions—2, irritation of pudendi; 3, endometritis; 2, ovarian tumour; 1, polypus utero; 2, hypertrophy of uterus.
" 1 retroversion there was chronic oophoritis.—*B. and F. Med.-Chirurg. Rev.*, April, 1857, from *Virchow's Arch.*, Sept., 1856.

58. *Involuntary Production of the Lacteal Secretion by Electricity.*—Dr. A. Auber, of Macon, was applying the volta-faradic apparatus of Duchenne on the right breast of a woman who had been delivered seven months, who had not suckled. The object of applying it was to remove an anæsthesia of the skin. After the third application, the patient complained of being *as she was after her milk fever*, and obliged to cover her breasts, *both* of which moistened her dress. On the fifth application, some milk, of which a spoonful was collected, was examined by microscope. It seemed quite similar to that of a woman newly delivered.

Dr. Auber refers to a case in which the lacteal secretion was in like manner produced by M. Becquerel. He anticipates the possibility of thus making any woman fit to suckle.—*B. and F. Med.-Chirurg. Rev.*, April, 1857, from *L'Union Médicale*, Jan. 20, 1857.

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59. *Pregnancy in a Two-horned Uterus.*—Dr. Lumpe refers to a description, published by him in 1843, in the *Oesterr. Med. Wochenschr.*, of the autopsy of a woman who died of metro-peritonitis four days after delivery. In this case the uterus was found divided longitudinally as far as the os internum. The os internum and cervix were simple. The right cavity, which contained no ovum, was enlarged, and lined with a thin vascular decidua.

The following case is a further illustration of this remarkable anomaly. A woman, aged thirty, who had lived in barren wedlock for ten years, sought advice on account of menorrhagia and leucorrhœa. Dr. Lumpe found the external genitals quite normal; the vagina, simple for the first third from outlet, was apparently divided into two equal canals throughout the upper two-thirds. The septum presented a complete duplicature of the vaginal mucous membrane, which was attached in front along the urethra, and hung loose, flapping like a sail behind; so that during exploration by the finger, it sometimes covered the right and sometimes the left cervix in such a manner, that on superficial examination, the bicornute condition of the uterus might have been overlooked. An unequivocal solution was only obtained by using two fingers. From each half-vagina was felt a completely developed cervix. Both cervices were of equal size, and on the same level; they diverged from the point of union to either side, nearly at a right angle; they were quite symmetrical, and provided with a small cross-fissured os, which admitted a sound. No clear examination of the bodies of the uterus could be made by palpation; but the fundus appeared to be bent right and left, exactly as was the case with the two cervices.

Dr. Lumpe had no opportunity of seeing this case again till some time after, when he was suddenly called to separate an adherent placenta. In performing this, Dr. Lumpe found a complete cavity, bent towards the left like a retort; the placenta was adherent to the fundus; this had a remarkably long oval form. The right non-pregnant uterine-horn had been so much hypertrophied, that it reached nearly half the size of the other. The vaginal portion of the right horn was quite effaced, and its orifice only marked by a soft, cushion-like ring.

Labour had come on at the beginning of the ninth month without obvious cause, and had proceeded naturally and easily under tolerably strong pains. The child was delicate, but lively. The puerperal period was passed favourably. The involution of the uterus proceeded regularly as in the undivided uterus.—*Ibid.*, from *Wochenbl. Zeitschr. der k. k. Gesellssch. d. Aerzte zu Wien*, August, 1856.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

60. *Death from the Inhalation of Chloroform.*—Jos. Allen, Esq., Jun., house-surgeon to the Royal Infirmary, Liverpool, relates (*Lancet*, April 25, 1857) the following case of this which occurred at the Infirmary on the 5th of April last:—

"T. N——, aged thirty-five, a labourer, of intemperate habits, thin, with somewhat sallow countenance and anxious expression, was admitted March 18, under the care of Mr. Edward R. Bickersteth, with an aneurism of about four weeks' standing in the left popliteal space. It was determined to ligature the femoral artery, which was accordingly done on the 31st of March, without any difficulty, the patient being under the influence of chloroform. The same afternoon he complained of great pain in the limb and numbness; in the evening the foot became cold, and the next morning it was evident that gangrene of the limb had commenced. On the 4th inst., four days after the operation, it was decided, after a consultation, to amputate the limb. Accordingly, about 11 A. M. on the 5th, I proceeded to give chloroform in the ward; that employed was Duncan and Flockhart's, specific gravity, 1497. It was poured on a piece of lint, which was then held at a short distance from the nose and mouth. The patient took it readily, and appeared to come under its influence more quickly than on the previous occasion. There was a short period of excitement, with some struggling, but no congestion of the face of any note, and he soon passed into a stertorous condition, taking deep inspirations, the expirations being short. In about ten or twelve seconds more he was completely under the influence; breathing tranquil, conjunctivæ insensible. The quantity of chloroform was not measured, but he had taken about one drachm and a half, certainly not more than two drachms. The whole time occupied in giving chloroform in the ward was about five or six minutes from its first commencement.

"He was now removed on a stretcher to the operating theatre, and placed on the table. About two minutes would thus elapse, during which time no chloroform was inhaled. He had *slightly* recovered from its effects, and was breathing tranquilly and freely; pulse weak, not much affected by the inhalation. About half a drachm of chloroform was now poured on some lint, which was held to the nostrils, and he then became *fully* under the influence; respirations *good;* pulse frequent, feeble. The operation was about to be commenced, and I was pouring about twenty minims more chloroform on the lint (having pronounced the patient to be in a fit state), so as to be ready to give him some more as occasion required, but had not applied it, when, turning round, I noticed something peculiar in his general appearance, and, on lifting up the eyelid, found the pupil dilated, and the lid did not close over on the removal of the finger; the eyes were slightly turned up. I at once felt for the temporal artery, but there was no pulsation, and none detected at the left wrist; the respirations had almost ceased. The head was lowered, cold water was dashed on the face, and the abdomen struck with the palm of the hand; the finger thrust into the mouth (there was no action of the heart felt); the legs were elevated, and a wet towel was dabbed over the epigastrium. After one or two blows the respirations now became better, and seemed good, and in about two minutes a pulse was felt at the wrist. This continued between two and three minutes, the respiration being good. His pulse then began to fail, and in about a minute more the respirations were less. The tongue was seized with a pair of forceps, and drawn forwards, and artificial respiration tried, and ammonia held to the nostrils; but he was becoming livid in the face, so the Ready Method was at once adopted, and this produced apparently a few *natural* respirations. But the pulse had gone, and in about two minutes more there was no breathing save artificial. About the time that the pulse stopped, there was a convulsive movement of the muscles of the leg, and a slight clamminess of the skin succeeded. The Ready Method was continued for half an hour, and galvanism tried, but without avail. From the time he was placed on the table to his death, or the cessation of natural respiration, about ten minutes elapsed.

"*Autopsy, twenty-five hours after death.*—Post-mortem rigidity remaining. On opening the skull the vessels of the dura mater contained fluid blood, but were not disturbed; the blood soon coagulated on exposure to the air. Some little fluid in a few of the subarachnoid spaces. Brain healthy, tolerably firm, and pale; medulla oblongata and upper part of spinal cord healthy and firm. On opening the chest the lungs were slightly collapsed; pleura healthy; pericar-

dium contained normal amount of clear serum; on parietal layer were several white patches, especially posteriorly. Heart: of natural size; right side flabby; left side contracted, but not firmly; right auricle and ventricle both contained some fluid blood (which afterwards coagulated on exposure), and a small soft clot; valves healthy; left auricle and ventricle contained some fluid blood and a small coagulum, but all the cavities were comparatively empty; the walls of the right ventricle were thin, and the muscular tissue of this and the left ventricle had a dingy, unhealthy look, and very readily tore. Under the microscope no oil-globules were detected; the fibres, however, were not well marked, and in many the true muscular tissue appeared to be wanting, its place being supplied by condensed cellular tissue. Pulmonary arteries contained coagula. Lungs: healthy, but tissue compressed; emphysematous towards free margins; no congestion of any note. Bronchi healthy. Liver: rather larger than natural; had a rotten, oily look; and on examination under the microscope numerous oil-globules were seen. Gall bladder healthy. Spleen: very pulpy and soft, but of natural size. Kidneys: left, small, from arrest of development, but healthy; right, healthy, but congested. Aorta: both thoracic and abdominal coats healthy. Vena cava: somewhat distended; healthy. Stomach and intestines: pale, but healthy. Blood: nothing particular noted about it.

"*Remarks.*—The chloroform was administered in this case in the same way as I have been constantly in the habit of giving it to other patients—viz., in small doses of about half a drachm or less at a time, on a piece of lint, so as to bring the patient *gradually* under its influence, and whenever any struggling or any congestion of the face, &c., takes place, suspending it for awhile, or giving it diluted with a *large* quantity of air; so, also, whenever the breathing becomes stertorous. This patient, on the previous occasion, took a much larger quantity of chloroform, and there was a good deal of excitement produced and stertorous breathing, before he became *fully* under the influence, but he soon recovered from the effects, so that it had constantly to be kept up. He had no bad symptoms attributable to the chloroform afterwards.

"He apparently sank from syncope, or cessation of the heart's action, for his respiration had been good just before he changed, and it continued for a second or two, though faint, when the pulse had stopped; and after the respiration had been restored, and was pretty good, the pulse was very feeble, and ceased two minutes before the respiration. The Ready Method acted very well; and if the sinking had been due to the respiratory system, it would have in all probability averted the melancholy event. The post-mortem appearances bear out this view—viz., of death from syncope, from the little blood found in the cavities of the heart, and the absence of congestion of any organ, so frequently noticed in these cases of death from chloroform; in fact, there appeared to be no excess of blood in the whole system. What, then, was the cause of the syncope? Was it the chloroform? This it is impossible to answer for certain. Doubtless the chloroform would have the tendency to produce it; and being under the influence of chloroform, it was more difficult to rouse the patient; in addition to which the muscular structure of the heart was not healthy. We have, moreover, to consider that the patient had only a few days before undergone an operation, and was suffering from gangrene. Yet, notwithstanding, I believe there is only one conclusion to be drawn—viz., that he died from the effects of the chloroform.

"As to the treatment: as the patient was unable to swallow any brandy, the application of ammonia to the nostrils, the lowering the head and elevation of the extremities, were the most suitable remedies, with the sudden application of the cold hand, or a wet towel, over the epigastrium, to rouse the system and excite respiration. This latter remedy had the desired effect for a time; afterwards the maintaining artificial respiration, by the Ready Method, in the hopes that the system might recover itself; and endeavouring, with the galvanic current, to excite the heart's action, as well as the respiratory movements. It is a question whether we do not discard too much in such cases the use of galvanism."

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61. *Death from Amylene.*—Dr. John Snow gives the following account of a case in which death followed the administration of amylene.

"Mr. Fergusson requested me to assist him on the 7th instant, in the case of a gentleman on whom he was about to operate for fistula in ano. The patient was 33 years of age, and was in good health, with the exception of the local complaint, although he had lived somewhat freely. Mr. Fergusson examined the patient's chest the day before the operation, and found the sounds of the heart to be normal. I felt his pulse just before he began to inhale. It was natural, but somewhat accelerated, as usually happens just before an operation. He was lying on his side in bed. About six fluidrachms of amylene were put into the inhaler (I never intentionally use all I put in, but add more before the paper becomes dry), and he breathed steadily and gently. The valve was gradually advanced over the opening in the face-piece till it about three-quarters covered it, and the patient appeared to become quietly unconscious in about two minutes. He breathed quickly for a few inspirations just as he appeared to become unconscious. Just after this, Mr. Fergusson came and felt the patient's pulse, and he says it was very good. I felt it also. I looked at my watch at this time, and it was two minutes and a half or two and three-quarters from the beginning of the inhalation. Mr. Fergusson commenced to use the probe, and, finding the patient did not flinch, he began to use the bistoury. Mr. P. C. Price assisted at the operation. I held the patient's thigh with one hand, as I often do in such an operation, lest he should flinch. He did not flinch, however, but kept his limbs tense, without moving them. Just at this moment I observed that the valve of the face-piece, which I had left three-quarters covering the opening, had moved so as to cover it entirely, but I cannot say whether or not the patient had taken an inspiration a little stronger than I intended, and thought nothing of the matter, as I have frequently had to close the valve completely in giving amylene. It could not, however, have been many seconds in that position, for I paid no attention to the operation, except so much as was requisite to guide me in what I was doing. The inhalation was discontinued at the moment I have mentioned, and on looking round directly after I found that the operation, which had apparently been but one incision, was finished. I now began to feel for the pulse, more out of constant habit, and from a scientific curiosity, than from any supposed necessity of doing so. Although it had been good only half a minute before, I could not find it in the left wrist, and only a slight flutter in the right one. His breathing was, however, good, indeed quite natural, and he did not seem even to be very insensible, for there was some motion both of his features and limbs as if he were about to awake. I watched the patient with great anxiety, thinking that surely his good and natural breathing would restore the pulse, and feeling that, at all events, this superseded any other measures at the moment. In two or three minutes, however, he seemed to be getting more insensible; he did not wink on the edge of the eyelids being touched, and the breathing was getting slower and deeper. I called Mr. Fergusson's attention to the patient, and both he, who was preparing to go away, and Mr. Price, who had all the time been standing by the patient, were surprised to find that anything could be wrong, as they had seen the patient going on apparently so well, not only during the inhalation, but after it was discontinued. They dashed cold water in his face, which did not seem to have any effect. His countenance was now livid, and his breathing of a gasping character. It soon began to leave off, with the exception of deep, distinct, gasping inspirations, and we, therefore, began to perform artificial respiration, by Dr. Marshall Hall's method, placing him in the prone position, and bringing him partly round, while Mr. Price kept the mouth open. The air could be distinctly heard passing through the larynx during this motion. We also tried pressing on the chest, with the head on one side and the mouth open, which answered very well as regarded the ingress and egress of air. Inflation from mouth to mouth was tried, but did not seem to answer so well. Although deep gasping inspirations were made by the patient till fully ten minutes had elapsed from the failure of the pulse, the measures used had no effect; I believe that I heard a feeble motion of the heart even after this period; and, as Mr. Fergusson perceived a slight pulsation at the same time in the right wrist, I was probably not mistaken. There were no further signs of life after this, although the

artificial respiration was continued for a long time. I am quite sure as to the length of time respiration continued after the failure of the heart's action. The pulse ceased to be distinctly perceptible at ten minutes before five, and the patient was still breathing at five o'clock. He had not taken food for some hours, but drank a pint bottle of ale a little while before the operation. A good portion of amylene remained in the inhaler after it had been uncovered for an hour and a half.

There was an examination of the body forty-eight hours after death. The body was rigid. There was a good amount of fat beneath the integuments. The cartilages of the ribs were ossified. The lungs were large, and did not collapse; they completely filled the cavity of the chest, and seemed by their texture to be emphysematous, although there were no large cells on the surface. There was a little congestion at the posterior surface of the left one; otherwise they were not very vascular. There was a little clear fluid in the pericardium. There was a good deal of fat on the surface of the heart, which was somewhat larger than natural. It was removed by cutting the great vessels before it was opened, and, in removing it, three or four ounces of dark-coloured fluid blood escaped. The right ventricle was somewhat dilated, otherwise the heart was healthy; the walls of the left ventricle seemed very thick, but it was contracted, so as almost to obliterate the cavity. The liver was vascular, dark-coloured, and friable. The stomach was healthy, and contained only a little mucus. The other organs were not examined. There was no odour of amylene in the body.

Although I used every care and attention in this case which seemed to be possible, I cannot attribute the patient's death to any other cause than the amylene. The failure of the pulse took place at the moment when the operation was performed; but, as the patient was unconscious, I can hardly connect the two events, or I might illustrate the case by one which I witnessed two or three years ago. In that case, the surgeon performed an operation for fistula before the patient was unconscious, in mistake, and immediately afterwards the patient, a youngish man, went through the process of apparently dying; but, fortunately, gave a gasp and recovered. He then told us what I very well knew, that he had felt the pain of the operation. He said that he did not complain, as he expected to feel it, for he could not believe what had been told him about chloroform.

I believe the patient had emphysema of the lungs. There was no such force used in the artificial respiration as could permanently dilate the air-cells, and the dilatation of the right ventricle indicates some chronic obstruction to the pulmonary circulation. In commenting on a case of death from chloroform, which occurred at the Mauritius, I made the following remarks: "The reporter considered that the emphysema was the cause of death, by interfering with expiration, and thus detaining the vapour; and it must be admitted that, if the vapour were not sufficiently diluted with air, the emphysema would increase the danger. At the same time I have had practical experience to show that when it is sufficiently diluted, it may be safely inhaled, even in extreme cases of emphysema."

The continuance of respiration so long after the heart is paralyzed, in the case I have related above, and in some deaths which have happened from chloroform, is an extremely curious event. It proves that some little circulation must be still going on through the brain, and, in fact, the slight fluttering pulse and feeble sounds of the heart once or twice heard indicate this; but, under these circumstances, why does not the heart itself recover? If the circulation were going on in the coronary arteries, it might be expected that the blood from the lungs, which has been aerated by respiration and freed from the narcotic vapour, would restore the action of the heart. Dr. Cockle has expressed the opinion, which is very probable, that the blood enters the coronary arteries in a retrograde manner, during the diastole of the ventricles, when the aorta, and such great arteries, are contracting on their contents; if so, with a very feeble circulation, the elasticity of the aorta, perhaps, cannot sufficiently act to cause a backward current, and perhaps, also, the over-narcotism of the

heart is itself an obstacle to the coronary circulation by the congestion in the capillary system which always attends on narcotism.

The above accident happened in the 144th case in which I have administered amylene. It is impossible to form an average from a single case. I do not know any reason why an accident like the above might not have occurred in one of the early cases in which I was giving chloroform, or, on the other hand, why I might not have been able to go on for four or five years at a time administering amylene, without any approach to an accident. The investigation of this agent has been actively taken up on the Continent, and the extent to which it will ultimately be used will probably not be much influenced by the occurrence I have had to relate.—*Med. Times and Gaz.*, April 18, 1857.

62. *Poisoning from the Application of the Belladonna Plaster to the Skin.*—The following case, recorded by Dr. Wm. JENNER (*Med. Times and Gaz.*, Nov. 22, 1856), is of practical value as enforcing a caution against the repeated application of belladonna plasters to the same surface.

"Mr. Th. having suffered for some time from pain in the back, palpitation, and dyspeptic symptoms, consulted on October 4 a physician, who prescribed nitro-muriatic acid, and a belladonna plaster, 9 inches by 6 inches, for the back. The plaster produced a crop of pustules, though the patient was not aware of it.

At 10 A. M., October 14, he removed the old plaster, and applied on the same part, now the seat of the pustules and of a few minute ulcers, a new one of like size.[1] At this time he felt particularly well. Soon after ten he left home. Between eleven and twelve, while in the city, he noticed that his tongue and throat were extremely dry, and that his tongue was covered with a white, clammy fur, which he could pull off in strings. The sense of dryness and discomfort of the tongue and throat were most distressing, and such as to impede articulation. At the same time he was affected with extreme desire to micturate, though he could pass only a few drops of perfectly colourless urine. From this time till he lost consciousness his desire to pass urine was constant; wherever he could retire he did so, but succeeded in expelling from the bladder, with considerable effort, only a few drops of colourless fluid. The sense of dryness of the tongue and throat continued to increase, and he soon began to feel a little confused in his head, so that he was fearful people would think he had been drinking. He transacted all his business correctly, though at his office, where he was between two and three o'clock, it was observed that there was something strange in his manner and speech. Here he drank some water, which seemed even to increase his sense of dryness of the tongue. He drove himself home, which he reached about three o'clock. His mind, by this time, was a good deal confused, and, feeling himself unable to pay his men, he placed the money he had just drawn from the bank in safety in his own room. Soon after he had, five or six times in quick succession, convulsive catchings of the extremities, face, and trunk, such, he says, as animals have when bitten by venomous serpents;[2] then his mind began to ramble, and his ordinary medical attendant, Mr. Knaggs, of Kentishtown, was sent for. When Mr. Knaggs arrived, Mr. Th. was very delirious, but still recognized him.

"I saw the patient about 6 P. M., at Mr. Knaggs' request. We found Mr. Th. much worse than when Mr. Knaggs had left him. He was standing by the bedside, supported by two men; he seemed to exercise very little control over the lower extremities, and to have very little power in them. It was clear that he must have fallen to the ground had he been left without support. He leaned a little to the right, as though the right side were weaker than the left; but then those about him told us that shortly before he had inclined to the left side. He was led, at my request, to the opposite side of the room, both legs dragged, but neither one more than the other. He was restless in the extreme, and would not lie down for an instant; his hands were in constant motion; he seemed as if he were busy moving some light objects. Occasionally, he raised

[1] Both plasters were obtained from Mr. Bell, Oxford Street.

[2] Mr. T. is employed in the Zoological Gardens.

his feet alternately some distance from the ground, as one does in ascending stairs. He moved his mouth incessantly, evidently with the idea that he was talking; but the sounds that he uttered were inarticulate, and altogether unintelligible. He paid no attention to those about him; in fact, seemed unconscious of their presence, only now and then, when addressed in a loud voice, he stared at the speaker for an instant, like one suddenly aroused from a sound sleep. Once he laughed, when bid to put out his tongue, and in the most rapid manner protruded it, and then as quickly withdrew it. There was a little deviation of the face to the left, though not more than is natural to many adults, and is, I think, proper to Mr. Th. The pupils were very large; when the candle approached them, they acted equally, but imperfectly and sluggishly. The head was warm, but not warmer than the surface generally; the face was a little flushed. There was no throbbing of the vessels of the neck or head.

"The pulse was between 80 and 90, and regular. The heart's action was tolerably strong; the left ventricle was hypertrophied, and a loud, double, endocardial murmur was heard at the base.

"The history of the symptoms before Mr. Knaggs saw the patient was only obtained from him after his complete recovery, and so some doubt was at first entertained as to the nature of the case. Still, as the symptoms agreed with no disease of the brain or meninges with which I was acquainted, while the majority were such as occur in poisoning with belladonna, we thought it highly probable that they were due to absorption of belladonna by the skin. The plaster was accordingly removed at once, and the surface greased and washed, and clean linen put on, some of the belladonna having passed on to the shirt. A blister was applied to the back of the neck, and an aperient, with five grains of sesquicarbonate of ammonia, directed to be given every two hours. The first dose of the ammonia produced such decided improvement, that Mr. Knaggs gave a second dose in half an hour; this was followed almost instantly by perfect consciousness.

"The next morning Mr. Th. was able to arrange his accounts, though he had not slept for an instant. He had no sleep the following night, and his memory for two or three days was very defective. He does not remember anything that passed between Mr. Knaggs' first visit (and even of that he has only a dim recollection), and his return to consciousness, about 10½ or 11 P. M. He is now quite well, with the exception of slight dimness of vision, and dilatation of the pupils, and a consciousness of a little impairment of memory. There does not seem to have been any eruption on the skin, excepting the pustules, nor any itching on the surface."

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63. *A New Poison.*—M. De Luca recently communicated to the Imperial Academy of Sciences, the discovery of the poisonous principle of the *Cyclamen Europæum*, or common sowbread. This tuberculous plant has long been used in medicine as a violent purgative, and externally as a resolvent and a remedy for the earache; but it was not known that it contained a powerful poison, producing effects not unlike those of the curara, which the Indians of the Rio Negro use to poison their arrows with. M. De Luca obtains it by digesting the root for forty-five days in alcohol, then pounding the root, digesting it again in a fresh quantity of alcohol, and repeating this process until the pulp has lost its acrid taste. All the tinctures thus obtained are then left to spontaneous evaporation in a cellar. At the end of about forty days a whitish substance is deposited, which, after being repeatedly washed in boiling alcohol, is left to dry in the dark. The cyclamine, or vegetable base of the cyclamen, thus produced, is white, opaque, and brittle, and emits no particular smell; it absorbs the humidity of the air, becomes transparent and gelatinous in water, and assumes a dark colour when exposed to the action of light. It is a curious fact that, while pigs can eat any quantity of the root with impunity, not only the active principle itself, but even the natural juice of the root, acts as a poison on small fish, if mixed with the water in which they are in the proportion of 1 to 3000. Four grammes of the juice injected into the trachea of a rabbit caused it to die in convulsions in the course of ten minutes. Bromine appears to be an antidote to this poison, or at least to mitigate its effects considerably; it

has the same neutralizing power over the curara poison.—*Med. Times and Gaz.*, April 25, 1857.

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64. *Alleged Mental Unsoundness associated with Old Age.*—A somewhat significant and important case relating to alleged mental unsoundness, associated with old age, has within the last week been brought before one of our equity courts of law. We refer to the case reported in the *Times* of the 27th ultimo. The matter came before the Lords Justices, a petition, supported by numerous affidavits, having been presented to the Court of Appeal for a commission of lunacy, to inquire into the alleged lunacy of an aged gentleman, of the name of TAYLOR, resident at Hirwan, in Glamorganshire. We append the *Times'* report of the proceedings:—

"The subject of the application is Mr. Philip Taylor, an old gentleman, a retired grocer and draper, who is possessed of considerable property and resides at Hirwan, in Glamorganshire, and its object is to place him under the care of the Court of Chancery as a person of unsound mind, and incapable to manage his affairs. The petitioners are Mr. David Evans, of the same place, and Helen Eliza his wife, the niece of Mr. Taylor. The petition alleged that ever since April, 1856, he had been of unsound mind; that Mrs. Evans, when eighteen years of age, came to live with him (he being a widower), and so remained from 1841 to 1851, when she married; but in 1847 and 1856 he executed wills leaving her the bulk of his property; that Mr. and Mrs. Evans lived with him from October, 1855, to September, 1856, after which they removed to a house next door, but all lived together as one family; that on the 5th of December, 1856, Mr. Taylor left and went to reside with Mr. and Mrs. David Williams in another part of Hirwan, the latter being a niece of the late Mrs. Taylor, and that he on the same day was prevailed upon by them to execute a will in favour of Mr. and Mrs. Williams, the gentleman first called in to write it having refused to do so on the ground of the testator's incompetency. This petition was supported by many affidavits. The old gentleman had been examined by seven medical men, three of whom pronounced him of unsound mind, and four declaring him perfectly sane, but admitting him to be of impaired memory. In this state of the medical poll, there being a majority of only one, the Lords Justices determined to send a physician on their own behalf, and Dr. Forbes Winslow was deputed to perform the delicate task of examining the supposed lunatic, and to report the result of his experience to the Court. The report, dated the 30th of March last, concluded with this passage:—

"'I can detect no morbid alienation of affection in Mr. Taylor's mind. His memory is defective, perhaps more so than is generally the case at his age, and his mind is occasionally confused when questioned closely upon minute points of business, and when suddenly requested, without any assistance from his books, and papers, to give a detailed account of his somewhat complicated property; but this I conceive cannot be considered as satisfactory evidence of mental unsoundness such as to justify the application to the Court for a commission of inquiry. If evidence similar to this were generally considered sufficient to warrant the protection of the Court of Chancery on the plea of mental unsoundness, no aged man in the kingdom, with a memory somewhat impaired by age or bodily infirmity, would be safe from the suspicion of insanity or mental incapacity. During my five long interviews with Mr. Taylor, I subjected his mind to a most rigid examination, and applied to his understanding all the well-established tests with the view of thoroughly analyzing the sanity of his intellect, and, with the exception of an impaired memory upon matters of account, I could detect no one symptom that would justify the allegation of insanity. I therefore have the honour to report to your lordships that I am clearly of opinion that Mr. Philip Taylor is a person of sound mind, and capable of managing himself and his affairs.'

"Mr. CAIRNS supported the petition.

"Mr. W. M. James and Mr. Freeling, who appeared for the alleged lunatic, were not called upon.

"Lord Justice KNIGHT BRUCE.—Let the petition be dismissed.

"Lord Justice TURNER.—Certainly.

"Mr. CAIRNS hoped their lordships would see from the affidavits that Mr. and Mrs. Evans only performed a duty in seeking the protection of the Court for this aged relative. Had they not interfered, and anything serious had happened to him, they would have been blamed.

Lord Justice KNIGHT BRUCE.—Well, it is no doubt very disagreeable that an aged and wealthy uncle should suddenly exhibit a preference for his wife's niece at the expense of his own. There is, however, no help for it. Aged and wealthy men will be capricious. You have the old gentleman's deeds. Will you give them up?

"Mr. CAIRNS said his client would deliver them to Mr. Taylor, but some person should be present to attest the fact.

"Lord Justice KNIGHT BRUCE.—Why should this invalid gentleman be troubled by two sets of attorneys?

"Mr. W. M. JAMES.—Only to give some colour to the idea that he is not competent to receive and take care of the deeds.

"Lord Justice KNIGHT BRUCE.—Let the deeds be delivered upon the written receipt of Mr. Taylor. Our view of the evidence is such as that he is perfectly competent to give such a receipt."

This is not the first attempt that has been made (but happily frustrated), in the Court of Chancery to establish lunacy against persons advanced in life, the only justification for such a proceeding being an enfeeblement of memory, and an inability, on the part of the alleged lunatic, to give an off-hand, succinct account of the nature and extent of his pecuniary affairs. Dr. WINSLOW asks, "What old man in the kingdom is safe from the grasp of mercenary and designing relatives, if evidence of this character is admitted in our courts of law as proofs of mental unsoundness?" There is, no doubt, a form of mental decay and incapacity, associated with premature old age, occasionally presents itself, which requires, to meet the justice of the case, a modified kind of legal protection; but it would be the height of cruelty to make such persons the subject of a formal commission of lunacy, thus casting not only upon themselves, but upon their descendants, the imputation, slur, and odium of insanity. Dr. FORBES WINSLOW has frequently reverted to this subject in the *Psychological Journal;* and we believe it is the intention of this gentleman to bring the question in detail before the medical and legal professions, with the view of obtaining some alteration of the law respecting cases of mental incapacity, often associated with old age, which cannot, without a gross and unjustifiable abuse of terms, be designated in legal phraseology as either "*insanity,*" "*idiocy,*" "*imbecility,*" or "*unsoundness of mind.*" We hope Dr. WINSLOW will not lose sight of this deeply interesting and important *social* as well as medico-legal question. We have often been much impressed with the unfair mode adopted by persons desirous, *coute qui coute,* to get at evidence to establish mental unsoundness in certain cases. If an impairment of the faculty of memory, and an inability to give minute and accurate details as to the nature, extent, and value of property, are to be held as valid evidence justifying the interference and protection of the Court of Chancery, there are, we fear, living at this moment, hundreds, nay, thousands of aged and infirm old gentlemen and ladies, under the happy delusion that they are perfectly sane and mentally sound persons, fully competent to be at large, and quite fit for the management of themselves and their affairs. Let any psychological expert examine any one of these old gentlemen and ladies for the purpose of making an affidavit in support of the allegation of lunacy, and nine-tenths of them will easily succumb to the insane test, if impaired memory as to minute matters of detail connected with property is sufficient to establish the theory of mental unsoundness. Society must be protected from such a dangerous doctrine and so lax a practice. Dr. WINSLOW has invariably, whenever called upon, as he often is, by the Court of Chancery to investigate these delicate questions, taken high vantage ground, always fighting the battle of persons advanced in life, who merely on account of a decayed memory are alleged to be of unsound mind, and fit subjects for a commission of lunacy.

Our readers, no doubt, have a vivid recollection of the remarkable and notorious case of Mrs. CATHERINE CUMMING, and of the great efforts made by Drs.

Winslow, Conolly, and Barnes, to protect this aged lady from the accusation of mental incapacity, as well as from the kind but misdirected attention of her family. The celebrated Eyre Arms jury, unhappily for Mrs. Cumming, and unfortunately, as it has turned out, for her estate, ignored the evidence of Drs. Winslow, Conolly, and Barnes, and listening to the persuasive eloquence of a brilliant advocate (Sir Frederick Thesiger), brought in a verdict of insanity. What has been the result? Not one penny of that large property has, as yet, passed into the pockets of any one member of her family! Is this to be considered as another illustration of retributive justice? Mrs. Cumming was no more insane than is Mr. Philip Taylor. Fortunately for this gentleman's peace of mind and property, the Lords Justices have provokingly nipped his alleged lunacy in the bud.—*Lancet*, May 2, 1857.

65. *Transformation of Amygdaline into Hydrocyanic Acid within the Body.*—Professor Kolliker and Dr. Muller, of Würzburg, have arrived at the following results from a series of experiments: 1. Amygdaline and emulsine introduced separately into the circulatory system by different channels, form prussic acid in the blood. 2. When the quantity of these substances is sufficiently large, death soon occurs; it takes place more slowly with weaker doses. When amygdaline is first injected into the blood, and emulsine an hour afterwards, death speedily occurs. 3. When emulsine is first injected, and amygdaline forty-five minutes afterwards, death is retarded. Is the emulsine changed in the blood, or rapidly excreted? 4. Poisoning is not produced by injecting amygdaline into the blood, and emulsine into the alimentary canal. The emulsine, therefore, does not pass from the blood into the digestive canal, at least not without some change; on the other hand, it is not found in the intestines on post-mortem examination. 5. When emulsine is injected into the blood, and amygdaline into the intestines, poisoning occurs, though slowly. Death has been produced by introducing amygdaline into the digestive canal of rabbits, without any emulsine. The intestines of these animals contain a ferment, capable of converting amygdaline into prussic acid. 6. Amygdaline injected into the veins, or into the intestines, passes off in large quantities, sometimes rapidly by the urine; some experimenters, as Wöhler and Frerichs, have not found amygdaline with certainty in this excretion; others, as Ranke, suppose it to be converted into formic acid.—*B. and F. Med.-Chirurg. Rev.*, April, 1857, from *Allgem. Medicin. Central Zeitung*, 1856, p. 72.

MISCELLANEOUS.

66. *Ophthalmological Congress.*—The Committee of Editors of the "*Annales d' Oculistique*" have convoked, at Brussels, a Congress of Ophthalmologists, to which they invite all members of the profession, in every country, who are interested in this branch of medical science. The meeting is to be held on the 13th, 14th, 15th and 16th of next September.

The Committee for the organization of the Congress are:—

Fallot, President of the Roy. Acad. Med. of Belgium—*President.*

Bosch, Surgeon to the Ophthalmological Institute of Brabant, &c.; Hairion, Director of the Ophthalmological Institution of the army at Louvain, &c.; and Van-Roosbroeck, Director of the Ophthalmological Institute of Brabant, &c.—*Members.*

Warlomont, Chief Editor of the *Annales d' Oculistique*—*General Secretary.*

All letters and communications relative to the Congress should be addressed to the Secretary General, Rue Notre-Dame 27, Brussels.

Communications will be received in all languages.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Note of the Delivery of a Female, one of whose Lower Limbs had been Disarticulated at the Hip-Joint, seventeen years since, for Morbus Coxarius. By JOHN H. PACKARD, M. D.—A few months since, a case of pregnancy came under my notice, occurring in a coloured girl about 23 years of age. She seemed stout and hearty, although presenting marks of scrofulous enlargement of the cervical glands.

I learned that she had been, in 1840, the subject of disarticulation of the hip-joint for morbus coxarius. The operation, which was performed by Dr. Duffy, of this city, was at the time considered a very rash one; the patient's condition was very low, and the acetabulum was involved in the disease; yet the patient, seventeen years afterwards, presents a fine healthy stump, and a beautiful cicatrix. Her delivery, which took place at the Blockley Almshouse, was perfectly successful.

Surely this operation, *in this case*, has "stood the test of time."

No one would pretend to say that this single instance, in which a favourable result ensued, should lead to the general adoption of this plan of treatment for coxalgia; or that the disease was entirely cured in this individual; but it might, perhaps, justify a similar operation in some cases, and is, at any rate, another remarkable instance of recovery under what would be generally considered desperate circumstances. Perhaps, also, in reference to a case like this, it might be asked of those who call the necessity for operative interference the opprobrium of surgery, whether more could be expected of any medical treatment than to give a dying child an additional term of life of at least seventeen years?

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Case of Fracture of the Pelvis during Pregnancy. By J. WHITAKER, M. D., of Lewistown, Niagara Co., N. Y.—On the 18th day of December last, I was consulted by Mrs. W., who informed me that she had received a fall the day before, slipping down a pair of steps, and striking astride the edge of an open upright barrel. My fears for her safety were aroused when she informed me that she was in the seventh month of gestation. She complained of excruciating pain in the left pubic region on the least motion. On examination, I found an oblique fracture of the body of the left os pubis; there was but little displacement, no lesion of the bladder or rectum, and fortunately no positive attempt at miscarriage. A roller bandage was applied around the pelvis, opiates were administered, and the urine drawn off for three days by means of the catheter. No bad symptoms supervened, and in six weeks the patient was able to walk about the room. On the 6th of March inst. she was delivered, after an easy labour, of a healthy female child, weighing ten pounds. The fracture was of course reopened, and I was not surprised in seeing symptoms of peritonitis present themselves; these were promptly met by bloodlettings, and the exhibition afterward of calomel and opium. The inflammation yielded kindly, and I am happy to

state that at this date the patient is doing exceedingly well, and will be up in a few days.

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Ovariotomy Successful. By E. P. BENNETT, M. D., Danbury, Conn.—The patient was a Mrs. Stevens, aged 49, married, and had borne children. Until within the last six or seven years she had enjoyed good health. I saw her about the middle of April last, when she appeared almost as large as a woman at the full period of gestation. Upon examination there was a feel as of two distinct tumors, but, upon close investigation, I was convinced it was a case of multilocular ovarian dropsy. The mass was quite movable, so that I was well satisfied that no extensive adhesions existed. I operated on the 25th of April by an incision about four inches in length; tapped four cysts as the sac was pulled out by my son; turned the patient upon her face near the edge of the table to facilitate the escape of the fluid; drew out the sac, and tied with a double ligature. The only trouble experienced in the operation was the protrusion of the omentum. On the tenth day the ligatures unexpectedly came away, and at the end of two weeks she was able to sit up and walk about her room, the wound having entirely closed. This has most truly been a fortunate case, and I am more firmly than ever grounded in the belief, that in well selected cases extirpation is of all others the remedy to be relied upon for the cure of this fatal disease. There are, on the other hand, cases which cannot be removed with any rational prospect of success in consequence of extensive adhesions; these are the cases to be treated by injections or by the establishment of fistulous openings (not into the cavity of the abdomen, as recommended by Dr. Simpson, but through the abdominal walls externally). Treated in this way the sac continually shrinks, and in some cases comes away piece by piece, and the patient recovers in a great measure, if not entirely, her health. The young lady upon whom I operated in Jan. 1856, continues in good health.

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Death following the Inhalation of a Mixture of Ether and Chloroform. By R. CROCKETT, M. D., of Wytheville, Va. (Communicated in a letter to the Editor.) MY DEAR SIR: I feel impelled from a sense of professional duty to communicate to you the following case of death resulting from the use of ether and chloroform.

A sprightly little boy, five years of age, the son of Mr. Bonham, of Smyth County, was brought to me by his physician, Dr. A. Kincannon, of that county, to have a fatty tumour removed from his back. The tumour was a large one, commencing at a point at its inferior termination opposite the last rib, about two and a half inches to the right of the spinous processes, and extending obliquely upwards, crossing the spine seven inches, requiring two elliptical incisions nine inches long for its removal.

The operation was commenced at half-past 9 o'clock A. M., April 4; the anæsthetic used was a mixture of washed ether, four parts, and one of chloroform. The anæsthetics were procured from Mr. Frederick Brown, whose character is a sufficient guarantee that they were pure. Dr. Kincannon, my son Dr. Joseph Crockett, and an intelligent pupil of mine, Mr. Campbell, present.

The anæsthetic was carefully mixed by myself, and a drachm of it poured on a funnel-shaped sponge prepared for that purpose. Every preparation for the operation having been made, the administration of the anæsthetic was commenced by myself, observing all the precautions so fully recommended by Erichsen, page 78 of his *Operative Surgery*, by Brinton. As soon as anæsthesia was induced, the sponge was confided to Dr. Kincannon, who held his fingers all the while on the patient's pulse. The operation was com-

menced as soon as the patient was brought under the influence of the anæsthetic; the dissection was rapidly executed, stopping to ligate a large artery that was early divided; the remaining arteries were compressed by Mr. Campbell as they were divided; the tumour was quickly removed, and a ligature applied to the last artery, being the sixth in number requiring the ligature. Whilst my son was sponging the wound, and waiting to see if any more arteries would spring, the little boy began to vomit. I immediately turned and took hold of his arm, and feeling his wrist, remarked to Dr. K. that he was pulseless; Dr. K. replied that "his pulse had never given way until he began to vomit." He ejected a small portion of the contents of the stomach. He was immediately placed in the "prone position" recommended by Dr. Marshall Hall in the July number of the *American Journal of the Medical Sciences*, page 224. I also introduced my finger into the mouth to be certain that the tongue had not fallen back so as to obstruct the glottis or the entrance of air into the windpipe. We persevered in these efforts, so fully and ably recommended by Dr. Hall, and my assistants in the mean time rubbed the extremities with aqua ammonia, &c. Electro-magnetism was not resorted to, as we were three miles in the country, and I had not my electro-magnetic apparatus with me. The patient died in three or four minutes from the commencement of vomiting. He lost probably four ounces of blood; certainly not exceeding six.

When Mr. Campbell removed his fingers from the last artery to be tied, there was a fine jet of florid blood from it, showing conclusively that he was not asphyxiated at that time. Anæsthesia was not carried so far at any stage of the operation as to produce the slightest stertor in breathing. Dr. K. assured me that up to the time he began to vomit there was nothing in the circulation or respiration to produce the least apprehension.

A post-mortem examination was prevented by the removal of the body in the afternoon train of that day.

I have latterly employed this anæsthetic freely, formerly having used ether alone. As yet I have not seen a case of death reported from ether, or this mixture of it with chloroform, that I can now recollect. Are then any such reported?

I greatly fear all the deaths from anæsthetics are not reported.

Mental Influence of Mother on Fœtus in Utero exerted through two successive Pregnancies. By S. L. Kerr, M. D., of El Paso, Woodford County, Ill.—In the forepart of May, 1852, a little daughter of Mrs. H. fell from a table, face foremost, on to a cooking-stove sufficiently hot to burn slightly. The cries of the child quickly brought to her assistance Mrs. H., who was in an adjoining room. Upon seeing her child on the stove, which she presumed to be quite hot, she became instantly alarmed, fearing the child was fatally burned. Her nervous system was shocked to such a degree that she did not recover from it for two weeks—her mind frequently turning to the accident. The child was slightly burned on its face, hands, and arms. Mrs. H. was in the seventh month of her third pregnancy. On July 27 her accouchement took place; I was called in; child was born some time before I arrived. Mrs. H. was comfortable. Her mother presented the child to me, saying, "Doctor, it is strangely marked." I was much surprised to see it blistered on its lips, in mouth, on right ear, on right elbow, both hands and fingers, on each knee, and on both ankles and feet. The blisters had every appearance of those from burns, were inflamed at the base, and filled with a light straw-coloured serum. The child seemed to suffer much pain, and died on the third

day. Mrs. H. is of nervous temperament, and, except an attack of chill fever in April previous, which had continued four or five days, had for some years enjoyed good health, and was altogether free from disease at that time.

She became pregnant again; accouchement took place Sept. 5, 1853; I attended her; her labour was short and easy. When the child was brought to view we were struck with amazement to see it marked precisely on the same parts and in the same manner as the above described one. The blisters were full of serum, and had the same appearance in every respect. Inflammation on its hands and feet was deep; sloughing set in; nearly all its fingers and toes sloughed off. Blisters on the other parts soon healed. Treatment—stimulating lotions, and magnesia internally. In October following, ulcers were all healed, and child healthy. Mrs. H.'s health during this last pregnancy was good, and her mind was easy. She never once feared that that child would be marked. In the fall of 1854 she gave birth to another child, which was healthy and free from any mark. I have seen accounts of several remarkable cases of the mental influence of the mother upon the child *in utero*, but never of a case where the influence extended to the second child. She feared the first one would be marked; she had no apprehension that the second would. The nervous impression must have continued until the second was affected as above described. Cases less remarkable than the foregoing are on record; these too, I think, are worthy of a place. I leave them to you and others for comment.

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Case of Arrest of Development. By S. L. KERR, M. D., of El Paso, Woodford Co., Ill.—Mrs. M., on the 6th April, gave birth to a female child which has no arm on its right shoulder; instead of which there is a fold of skin an inch in length. The arm on the left shoulder is without elbow-joint, the third and fourth fingers, and that part of the hand behind them. The distance from shoulder-joint to wrist-joint was precisely four inches. It is free from any other visible imperfection; it is Mrs. M.'s fourth child; other three are living, and perfect in form. No cause for the freak is known.

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Case of Fibrinous Plugs in the Abdominal Aorta, Right Iliac, and Right Subclavian Arteries. By G. A. WILBUR, M. D., of Skowhegan, Me.—Mr. J. R., of Norridgewock, Me., aged about 60, a farmer, and rough carpenter, accustomed to lift heavy weights; while away from home at a hard day's work, and without dinner, fourteen years since, was taken with severe pain which he called "cramp" in the stomach, attacks of which he has had, at irregular intervals, ever since. When a paroxysm commenced, it could usually be stopped by swallowing food, or a carminative; and when it left him it was with a gurgling sensation, as if the cause had been gas.

Dec. 28, 1856. After having suffered for about a week with an unusual headache and slight chills on retiring, he was seized with excruciating pain in the right leg, with a violent chill that chattered his teeth and shook his bed. Stimulants and rubbing were applied to the leg, and in a few hours the pain subsided. In three or four days the pain seized his right forearm, which also yielded after six or eight hours, leaving the arm palsied for a time, and permanently pulseless. In each instance the chill was followed by a hot stage, which was succeeded by a profuse sweat. These paroxysms, excepting the pain, continued to occur at irregular intervals of about twenty-four hours. During three or four of the paroxysms he was noticed to be slightly delirious; at other times he was rational and calm. He slept well, unless under the influence of an opiate, which, as heretofore, made him wakeful.

Jan. 10, 1857. I was called for the first time to see him, when I obtained the above history of the case from his family. I found him with left eye somewhat suffused, articulation rather indistinct, and deglutition clumsy; right wrist, elbow, axilla, and subclavian pulseless; sought for tumour in subclavian region, but found none; therefore examined right leg, no pulse at the ankle, and only a slight jar at the knee. Although the pulse was absent at the right wrist, yet, on compressing the artery, I could at the moment perceive the blood flow against my finger as if obstructed by it. This pulseless condition continued until death, excepting, when the arm had been rubbed for half an hour, I could detect a slight pulse at the wrist. He continued to have the shakes, hot and sweating stages at irregular intervals up to the 13th, when he had a violent paroxysm in the evening as his shake passed off. I found him with a pulse so irregular as to prevent counting it; the action of the heart also irregular and furious, both sounds resembling that elicited by snapping the finger against a piece of thick cloth very moderately stretched. The pulsation of the abdominal aorta in the hypogastric region sounded like percussion over a tympanitic abdomen, and was audible at the distance of eight or ten feet at least; these sounds arose above those of the heart, even with the ear applied to the cardiac region for the purpose of auscultation. He had no more shakes, but in their stead he had paroxysms of similar action of heart and aorta up to the morning of the 17th, and the only change in his symptoms was a gradual loss of strength. On the morning of the 17th he suffered considerably from pain in the right limbs, and, for the first time since his attack of chills, from his old acquaintance "cramp in the stomach." On the evening of this day he was very low, pulse irregular and weak, and the dorsum of right foot and parts of the leg had assumed a dark mahogany colour, not to be scattered by friction or pressure; this discoloration gradually spread over his right leg, arm, back, and left leg, and he sunk gradually until the 23d, when he died.

Post-mortem examination had about thirty-six hours after death.—We detected no disease of the stomach, liver, bowels, kidneys, pancreas, or lungs, excepting a slight congestion of left lung. Spleen weighed about two pounds, and was so softened in places as hardly to retain its form when laid upon a level surface. Heart: the inner surface of the left auriculo-ventricular opening presented a spot about three-quarters of an inch in length by one-sixteenth of an inch wide, of a dark brown colour, and indurated like a scirrhus. The discoloration is not entirely lost, though macerated in alcohol for more than two weeks. Arteries: the subclavian where it gives off the thyroid axis, the abdominal aorta at its bifurcation, and the right common iliac at its bifurcation, were plugged with what seemed to be fibrin almost organized. How did the disease of the heart, or other cause, produce these plugs?

DOMESTIC SUMMARY.

Excision of the Tonsils.—Dr. J. Mason Warren made (March 23d, 1857) a highly interesting communication to the Boston Society for Medical Improvement on this subject.

He stated that he had lately removed the tonsils from a child in whom, in addition to the ordinary symptoms of obstruction to the breathing and alteration of the voice, was produced a most remarkable spasmodic cough, resembling the barking of a dog.

Dr. W. said he would take this opportunity to speak of the result of his experience in the operation for excision of the tonsils. Some years since (1839) he had read, before this Society, some remarks on enlargement of the tonsils, attended by certain deformities of the chest, and the result of twenty cases was given, in which the operation had been performed. This was published afterwards in the *Philadelphia Medical Examiner*. More lately, he had given the result of two hundred cases which required operation; and at present, his experience would reach to above five hundred instances in which the tonsils required to be removed. These cases had not been taken indiscriminately, but the operation was only performed where the symptoms were more or less urgent, and other remedies had failed in affording relief: causing deformity of the chest, difficulty of breathing, choking at night, unnatural and offensive discharge from the mouth and nasal passages. Many of these cases were brought from a distance, on account of the importance and severity of the disease.

In none of these cases had he ever seen any fatal accident occur, or had reason to regret the operation. In but two cases, and those not in his own practice, but where he had been called in after the operation, had he seen any serious hemorrhage; both these cases did well. In almost all of them the symptoms were at once relieved; the patient was able to take his food with comfort, to sleep better, and exchanged a pallid and depressed aspect, for a healthy and animated appearance. To the rapidity with which some of them had gained flesh, as soon as a proper amount of oxygen was allowed to penetrate to the lungs, many of the gentlemen present would bear witness. He could conscientiously say that he knew no minor operation in surgery that afforded greater relief and more satisfactory results than the one under consideration.

In answer to the question whether the tonsils were ever reproduced, requiring a repetition of the operation, Dr. W. said that in four or five instances only had he been obliged to repeat the operation. The whole of the tonsil never is, or ought not to be, removed. When the enlargement is very great and irregular, it sometimes extends down the throat with a broad base, and it is not possible to embrace at once in the instrument as much of the tonsil as it would be desirable to remove, and the apex only is excised. The consequence is, that the lower portion afterward rises up and comes into view, causing obstruction, and requiring another operation. These cases, were, however, very exceptional.

The instrument that Dr. Warren had always used was the guillotine instrument, introduced into practice by Dr. J. C. Warren, made perfectly simple, without any needle or spring, to seize or drag out the part to be removed. The thick mucus of the fauces causes the portion cut off to stick to the instrument, so that it seldom escapes into the throat. The objection to those instruments which cut by pulling the knife out, is that they require to be kept constantly sharp, otherwise the tonsil may be dragged or torn. The guillotine instrument does not require this; in fact it is better dull, causing less hemorrhage, and possibly a subsequent greater destruction of that part which remains. His own instrument had been at the instrument-makers but once or twice for the last fifteen years. It was kept bright and in good order by not putting the blades together except when used.

In this connection, Dr. W. said that he had once seen death occur from enlargement of the tonsils. A young man was brought into the Massachusetts General Hospital in a state of strangulation, and it was necessary to open the trachea to save him from instant death. Stimulating injections of brandy and water were given him, as he was unable to swallow, and by this means he was kept alive some hours, but finally died from exhaustion. It was subsequently ascertained that he had been confined some days on board ship with a sore throat, but no danger had been apprehended until the urgent symptoms came on for which he was removed to the hospital. After his death, the finger being introduced into the throat, revealed the cause of his death. The tonsils were so much enlarged as to completely fill up the posterior fauces, and were firmly wedged one into the other, and had finally pressed down the epiglottis, entirely obstructing the passage of air to the lungs. (See *Society's Records*, vol. i. p. 233.)—*Boston Med. and Surg. Journ.*, April 23, 1857.

Complete Dislocation of the Cervical Vertebræ.—Dr. Daniel Ayres, of Brooklyn, N. Y., records (*New York Journ. of Med.*, Jan. 1857,) an interesting case of this, in which reduction was effected on the tenth day, and the patient recovered.

The subject of it was a labouring man, 30 years of age, tall and muscular, with a neck longer than usual, who, on the evening of the 2d of October, was taken home drunk and insensible. When he recovered, the next morning, his sensibility, his wife supposed him to be suffering from a stiff neck and cold, and made some domestic applications, without relief being afforded.

On the ninth day after the accident, Dr. Ayres was called in to see him, when his condition was as follows:—

"With some assistance and great personal effort, he was able to get out of bed, moving very slowly and cautiously. Desiring to expectorate, he was obliged to get down on hands and knees, which he accomplished with the same deliberation. When seated in a chair, the head was thrown back and permanently fixed; the face turned upwards with an anxious expression. The anterior portion of the neck, bulging forwards, was strongly convex, rendering the larynx very prominent. The integuments of this region were exceedingly tense and intolerant of pressure. The posterior portion of the neck exhibited a sharp, sudden angle at the junction of the fifth and sixth cervical vertebræ, around which the integuments laid in folds. It was difficult to reach the bottom of this angle even with strong pressure of the fingers, and of course the regular line formed by the projecting spinous processes was abruptly lost. He complained of intense and constant pain at this point, which was neither relieved nor aggravated by pressure. With difficulty he swallowed small quantities of liquid, pausing after each effort, and could not be induced to take solid food, since the first attempt to do so after the accident was followed by violent paroxysms of coughing and choking. His breathing was obstructed and somewhat laboured, being unable fully to clear the bronchia of their secretion. This, however, seemed rather an effect of the tense condition of the soft parts of the neck, than the result of pressure upon the spinal cord, since he presented no evidence of paralysis, either of motion or sensation, in parts below the neck. The sterno-cleido-mastoid muscles of both sides were felt quite soft and relaxed.

"But one conclusion could be formed upon this state of facts, to wit: that the oblique processes of both sides were completely dislocated. The marked rigidity of the head seemed to preclude the probability of fracture through the vertebral bodies, and although the cartilage might be separated anteriorly, yet, the body not pressing backwards sufficiently to produce paralysis of the cord, it was hoped that the posterior vertebral ligament remained uninjured; it was, therefore, determined to make an effort at reduction on the following day.

"The patient was placed upon a strong table in a recumbent position, with a pillow resting under the shoulders, the head being supported by the hand during the administration of chloroform, of which an ounce was given before anæsthesia ensued. Counter extension being made by two folded sheets placed obliquely across the shoulders and properly held, the head was grasped by one hand placed under the chin, the other over the occiput, and by steadily and firmly drawing the head directly backwards, and then upwards, an attempt was made at reduction, but failed for want of sufficient power. Dr. Ingraham was then requested to place his hands immediately over my own in the same position as before, and steady traction was again made in the same direction. Our united strength was required in drawing the head backwards and upwards, to dislodge the superior oblique processes from their abnormal position. When this was felt to be yielding by Dr. Cullen (who kept one hand constantly at the seat of dislocation), Dr. Potter was directed to place his hands under our own, still in position, and assist in bringing the head forward; at the same time the chest was depressed towards the table. The bones were distinctly felt to slip into their places; the line of the spine was instantly restored, the head and neck assuming their natural position and aspect. As soon as the patient became conscious, he expressed himself ignorant of what had taken place, but free from pain, and, in his own language, 'all right.' A bandage was

arranged to support the head and keep it bent forward. He had an anodyne for two nights following, after which no further treatment was necessary, and at the end of one week he had complete control over the movements of the head and neck. Beyond the debility and emaciation immediately dependent upon protracted fasting and loss of rest, he has experienced no uneasiness since the operation. His appetite is now good, and all the functions perform their duty normally. In a subsequent inquiry, to determine if possible the cause of the accident, he states that he distinctly recollects going into a store in Atlantic Street, near the ferry, and there having angry words with an acquaintance; that he left the store and was proceeding up the street (which is here a rather steep ascent), when he was violently struck from behind, over the lower portion of the neck. He likewise remembers falling forward and striking against some object, but does not know what it was, nor what took place until the following morning."

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Femoral Aneurism cured by Veratrum Viride, Manipulation and Compression. —In our number for January last, p. 256, we noticed the proposition of Mr. Fergusson to treat aneurisms by manipulation, and in our present number, p. 244, we have given the details of a case of subclavian aneurism successfully treated by this means by Mr. Little.

Dr. Geo. C. Blackman, Professor of Surgery in the Medical College of Ohio, reports (*Western Lancet*, June, 1857) the following interesting case of femoral aneurism treated by this plan combined with pressure and the administration of veratrum viride:—

"John Austin, æt. 28, a native of England, entered the Commercial Hospital on the 7th of April. Four months previously, he felt a sharp pain along the course of the femoral artery at the junction of the lower and middle third of the thigh, and for the first time he observed a pulsation in this region. He had worked for many years as a file-cutter, and had been accustomed to use a small anvil, which was held between his thighs. A swelling was soon detected, and this continued to increase until the time of his admission. There was a space of about three inches between the upper margin of the tumour and Poupart's ligament, and measured along the axis of the limb, the swelling was five inches at its base. The aneurismal bruit was very distinct, and the pulsations perceptible across the amphitheatre. Compression at the groin caused the tumour to diminish considerably in size, and it would immediately regain its former dimensions when the pressure was removed. The patient complained of numbness and other painful sensations in the knee, leg, and foot. As the tumour was daily increasing, and as there was no other indication of disease of the arterial system, I determined to bring the patient under the influence of veratrum viride, in order to subdue the force of the circulation. From the time of his admission he was kept on a low diet, and cathartics were administered. On the 11th, I ordered six drops of the tincture every three hours. On the morning of the 12th, I found that the pulse had been reduced in frequency from 94 to 65. At ten o'clock A. M., of this day, he was brought before the class, when with my thumb I pressed forcibly into the aneurismal sac, for the purpose of dislodging a portion of its fibrinous layers, hoping thus partially to obstruct the artery, and to favour the further deposition of fibrin in the sac. Skey's tourniquet was now applied with moderate force between the tumour and Poupart's ligament. The progress of the case may be learned from the following record, kept by Dr. N. J. Sawyier, the House Surgeon:—

"At 12 A. M., his pulse being 110, full, strong, and bounding, he was bled ℥ix. Pulse came down to 50, soft and regular, and continued low for several days. (The following are extracts from the Case-Book):—

"*April* 13, A. M. Suffers no pain nor uneasiness at all; slept well last night. Entire limb diminishing rapidly in size. Kept the apparatus tight. General health good; whenever any untoward symptom arose, it was promptly met, and the patient kept in a good condition. At intervals, the shooting pain was felt in the tumour, but it gradually subsided altogether.

"17*th*. Prof. Blackman ordered the tourniquet to be taken off, the bandage reapplied from the toes, up over the tumour, upon which it was to be tightly

wrapped, and the patient to be bled, after which the following was administered: R.—Antimon. and potass. tart. gr. ¼; pulv. opii gr. ¼. Sig.—Take every 3 hours. Patient's pulse came down to 65, soft and regular.

19*th.* *Souffle* ceased entirely, but the pulsation continues, though it is very weak.

"22*d.* Pulsation in tumour has ceased altogether.

"25*th.* Is in fine spirits; has no pain, and wants to walk about. General health very good.

"30*th.* Has walked some steps, and complains of nothing but weakness.

"*May* 21. The pulsation in the tumor has never returned. The femoral is firmly plugged as far as the origin of the profunda, and in the popliteal space the pulsation of the artery is hardly perceptible. The tumour is daily decreasing in size, and the patient is anxious to leave the hospital and resume his business."

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Paracentesis Thoracis.—In the number of this journal for April, 1852, will be found an interesting paper on this subject, by Dr. HENRY J. BOWDITCH, of Boston.

In a more recent paper (*Bost. Med. and Surg. Journ.*, June 4, 1857), Dr. B. states that his subsequent experience has confirmed his belief of "the importance of this operation as a remedial measure, to be used *not as a last resource*, but like any other simple remedy, if necessary, at any period of the disease. I still use the exploring trocar, although, in some instances, where there has been a tendency to a re-accumulation of fluid, I have used a larger instrument."

He further states, that "since April 17, 1850, I have operated upon sixty-two individuals, of both sexes and all ages. I have punctured one hundred and eleven times. I know of nothing in practical medicine which has afforded me more satisfaction than this simple operation. I use designedly the expression —practical *medicine*, in contra-distinction to surgery. The perfect simplicity of the operation, to one satisfied of the correctness of his diagnosis, allies it to venesection or vaccination. I am well aware that many will wonder, and some, perhaps, will scoff at this classification. To such I would say—Do not theorize on your fears—*try the operation*, and then you can judge more clearly. You will find that, as performed in these cases (viz., with the exploring trocar), it is, 1st, as a general rule, less painful than a blister; 2d, that (if I may judge from my cases) it *never* does harm; 3d, when fluid is obtained, it *always* gives relief, either temporary or permanent; 4th, that very often it is the chief, if not the sole means capable of relieving severe symptoms, and even of saving life.

"If these statements are true—and I am as convinced of their truth as I am of anything in my whole medical experience—I am justified in asserting, that a physician does wrong and acts foolishly who allows any patient to suffer months or years of misery, or even death itself, from pleuritic effusion, at any age, from any cause and with any complications, without, at least, *a trial of thoracentesis*. I write thus strongly because I fear that surgeons, of even the highest reputation, still shrink from performing this operation. This fear, I presume, is owing to their considering it as similar to the operation laid down in all, or almost all, of their own manuals. From that operation they ought in most cases to shrink. That which is here advocated is of a totally different character, and is, so far as my experience goes, harmless."

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Chalk and Vinegar in Intermittent Fever.—Dr. HODSDEN stated, at the recent meeting of the East Tennessee Medical Society, that he had been eminently successful in this treatment of intermittent fever with a mixture of prepared chalk and vinegar. Every case had been cured, and without relapse. The dose is a tablespoonful of each, mixed together, and allowed to stand, to allow effervescence to take place, and then given an hour before the expected time of the chill. It acts always freely on the bowels and kidneys. A friend in the West, from whom he learned this remedy, stated that he had seen hundreds cured by it.—*Nashville Journ. Med. and Surg.*, June, 1857.

Gunshot Wound of the Heart and Stomach.—Dr. J. H. GRANT reports (*Charleston Med. Journ.*, May, 1857) a remarkable case of this. The subject of it, a constable, received a ball from a revolver which entered "a little to the right of the sternum, between the cartilages of the fifth and sixth ribs," perforated the pericardium, "entered the right ventricle about an inch from the apex, and emerged from the same on the under side of the heart, before going far enough to enter any other cavity," passed through the diaphragm and through the cardiac extremity of the stomach, and lodged on the left kidney. This man was in a state of collapse for fifteen hours, and continued to live for twenty-six days, without taking any nourishment. When the *post-mortem* was made, the wounds in the organs had healed, but the cicatrices were evident.

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Dislocation of the Femur reduced by Reid's Method.—Dr. T. G. MCELBRIGHT records (*Western Lancet*, April, 1857) a case of this. The subject of it was a lad 7 years of age, who had dislocated his femur on the dorsum of the ilium by a fall. The patient was rendered insensible by the inhalation of equal parts of chloroform and sulphuric ether, and in thirty seconds the dislocation was reduced.

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Wutzer's Operation for the Radical Reduction of Hernia.—This operation was successfully performed on the 9th of March last on a patient, in the Commercial Hospital, by Prof. GEO. C. BLACKMAN. The instrument was kept applied for six days, with but little suffering to the patient, and Dr. B. satisfied himself three weeks after the operation that the canal was completely closed.—*Western Lancet*, April, 1857.

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Spina Bifida, with Malformation of the Genitals.—In a paper published in the number of the *Journal* for October, 1856, Dr. Wm. H. Byford called attention to the concurrence of spina bifida and malformation of the genitals, and related three cases in which these coexisted.

Dr. S. KNEELAND, Jr., of Boston, relates (*Boston Med. and Surg. Journ.*, Feb. 12, 1857) a case in which these malformations coexisted. There were five spinal tumours over the last lumbar vertebræ.

Below the pubic region there was a protuberance, about one-third of an inch in prominence, and the same in diameter, looking more like an inversion of the mucous surface of the bladder than a penis—from this the urine constantly dribbled. There did not seem to be any bone where the pubis ought to be, and the finger could be pressed down quite deeply above the "penoid" protuberance into a yielding mass of viscera, which, from the gurgling of air and fluid, were evidently folds of intestine; whether these descended into the structure next described, forming a hernia, could not be clearly made out. On each side of the penis was a scrotum, extending round under the perineum to within half an inch of the anus; I call this a scrotum (though I could detect no testis in it) from the perfect resemblance of its wrinkled skin to that organ. This scrotum was about an inch wide and high in its middle portion, whence it faded out gradually towards the penis and anus; it looked very much like the old-fashioned epaulette of the common soldier. Between these scrotums, or "scrota," was a fissure extending for their whole length, which could be opened for about half an inch in its deepest part; it presented the ordinary appearance of the genital mucous membrane. No opening could be seen in it.

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Treatment of Erysipelas with Tobacco.—Dr. J. G. STEPHENSON calls (*Western Lancet*, May, 1857) the attention of the profession to the treatment of erysipelas by tobacco, and asserts that this agent is the most reliable one for subduing erysipelatous inflammation of which he has any knowledge. He covers the inflamed surface with wet tobacco leaves, which he permits to remain until much nausea is produced.

That the tobacco is as safe an application as the nitrate of silver can, we conceive, scarcely be maintained; while a more effectual application than the latter can hardly be required.

GRADUATES OF THE UNIVERSITY OF PENNSYLVANIA, 1857.

At a Public Commencement, held March 28, 1857, in the Musical Fund Hall, the Degree of Doctor of Medicine was conferred by HENRY VETHAKE, LL. D., Provost, upon the following gentlemen; after which an Address was delivered by SAMUEL JACKSON, M. D., Professor of the Institutes of Medicine.

NAME.	TOWN OR P. O.	COUNTY.	STATE.	SUBJECT OF THESIS.
Avery, Wm. C.	Greenborough,	Green,	Ala.	The Physician.
Barnet, Gabinus J.	Havana,		Cuba.	Iodide of Starch as a substitute for Cod-liver Oil in the Treatment of Phthisis Pulmonalis.
Biegler, Jos.	Rochester,	Monroe,	N. Y.	The Laws of Health.
Blackwell, Lewis S.	Pennington,	Mercer,	N. J.	Papaver Somniferum.
Boaz, Crispin D. (M. D.)	New Concord,	Calloway,	Ky.	Enteric Fever.
Bondurant, Thos. L.	Buckingham C. H.		Va.	Phthisis Pulmonalis.
Boude, John K.	Carthage,	Hancock,	Ill.	Delirium Tremens.
Bowers, Lorenzo F.	Mt. Carmel,	Wabash,	Ill.	Irritable Uterus.
Bowman, David Good	Philadelphia,		Pa.	Erysipelas.
Bowling, James Butler (M. D.)			Ky.	
Boykin, Edwin D.	Cooksville,	Noxubee,	Miss.	Variola.
Bradley, Ely	Belleville,	Conecuh,	Ala.	Dentition.
Bragg, John C.	Petersburg,	Dinwiddie,	Va.	Anæsthesia.
Breed, S. P. (M. D.)	Pleasant View,	Schuyler,	Ill.	Sympathy.
Bynum, Jos. M.	Pittsborough,	Chatham,	N. C.	Cinchona: its Alkaloids, and their Substitutes.
Bynum, Mark W.	Tripoli,	Tishomingo,	Miss.	Epidemic Cholera.
Caldwell, Henry M.	Greenville,	Butler,	Ala.	Enteric or Typhoid Fever.
Carter, John L.	Scoober,	Kemper,	Miss.	Anæsthesia.
Carter, Wm. E.	Lumpkin,	Stewart,	Ga.	The Tongue in Disease.
Caruthers, John W.	Commerce,	Tunica,	Miss.	Emetics, and their Mode of Action.
Catchings, Thos. A.	Bolton's Depot,	Hinds,	Miss.	Wounds of the Abdomen.
Cecil, Thos. W. (M. D.)	Cedar Bluff,	Tazewell,	Va.	Polypus of the Uterus.
Chandler, A. Henry	Dorchester,	Westmoreland,	N. B.	Mania.
Chaney, Thomas Y.	Deer Creek,	Issaquena,	Miss.	Pneumonia.
Chappell, O. W.	Dinwiddie C.H.,		Va.	Dysentery.
Child, Duff D.	Mobile,	Mobile,	Ala.	Function of the Spleen.
Coleman, Warner W.	Gloucester C.H.,	Gloucester,	Va.	Cholera Infantum.
Colley, Francis S. (M. D.)	Monroe,	Walton,	Ga.	Enteric Fever.
Cooper, John	Cooper's Plains,	Steuben,	N. Y.	Hydrated Sulphuric Acid.
Coppedge, Oliver D.	Cedar-Rock,	Franklin,	N. C.	Anatomy and Physiology of the Skin.
Coriell, W. Wallace	Rahway,	Essex,	N. J.	Inflammation.
Cottilla, Edw. F.	Havana,	Cuba,	Cuba.	Leprosy.
Cousins, A. S.	Petersburg,	Dinwiddie,	Va.	The Physician's Life.
Crichlow, John	Williamston,	Martin,	N. C.	Variola Confluent.
Curry, Walker	Kelly's Springs,	Talladega,	Ala.	Hypertrophy of the Heart.
Cutter, Benj. (M. D.)	Woburn,	Middlesex,	Mass.	False Cartilage in the Knee-Joint.
Cutter, Ephraim (M. D.)	Woburn,	Middlesex,	Mass.	Endosmosis.
Davis, Robert M.	New Store,	Buckingham,	Va.	Cholera Infantum.
Dayton, Ferdinand V.	Trenton,	Mercer,	N. J.	The Effects of Solar Light on Animal Life.
Demmé, Theodore A.	Philadelphia,		Pa.	Metastatic Abscesses.
Dimmitt, Elijah C.	Germantown,	Mason,	Ky.	The Early Treatment of Children.
Dixon, Jos. E.	Columbia,	Maury,	Tenn.	Epispastics.
Dorsey, Harry W.	Frederick,	Frederick,	Md.	Pleurisy.
Duer, James H.	Cincinnati,	Hamilton,	Ohio.	Correlation Psychical and Physical.

NAME.	TOWN OR P. O.	COUNTY.	STATE.	SUBJECT OF THESIS.
Estes, Henderson	Columbia,	Maury,	Tenn.	The Human Organism.
Everett, Robert C.	South Quay,	Nansemond,	Va.	Scarlatina.
Everingham, Joseph	West Point,	Lee,	Iowa.	Conduct of Natural Labor.
Ewing, Henry M.	Fulton House,	Lancaster,	Pa.	Pneumonia.
Fisher, Calvin P. W.	Boalsburg,	Centre,	Pa.	Cold: its Importance as a Therapeutical Anæsthetical Agent.
Forbes, Jos. J.	Greenville,	Pitt,	N. C.	Acute Rheumatism.
Forwood, J. Larkin.	Chester,	Delaware,	Pa.	The Physiology of the Circulation.
Fraser, E. Irvin	Harper's Home,	Brunswick,	Va.	Enteric Fever.
Friend, Nathaniel	Eutaw,	Greene,	Ala.	Anæsthesia in Labor.
Fuller, John L.	Leasburg,	Caswell,	N. C.	Inguinal Hernia.
Graves, James T.	Yanceyville,	Caswell,	N. C.	Influences Modifying the Effects of Medicines.
Grigsby, Jas. L.	Winchester,	Clark,	Ky.	Dysentery.
Handy, John H.	Franklin,	Williamson,	Tenn.	Acute Dysentery.
Hanner, Jas. P.	Franklin,	Williamson,	Tenn.	Action of Quinia and analogous Alkaloids.
Harris, Chas. H.	Rolesville,	Wake,	N. C.	Diagnosis.
Hattie, Alex. G.	Caledonia,	Guysborough,	N. Sco.	Inflammation.
Hawkins, Wm. H.	Rocky Comfort,	Sevier,	Ark.	Diseases most common to Southwestern Arkansas.
Henkel, Caspar C.	New Market,	Shenandoah,	Va.	Inguinal Hernia.
Hicks, Benj. B.	Oxford,	Granville,	N. C.	Acute Dysentery.
Hinkle, Albert G. B.	Point Pleasant,	Bucks,	Pa.	Enteric Fever.
Holmes, Laurentius	Olive Branch,	De Soto,	Miss.	Cholera Infantum.
Huntington, David L.	Charlestown,	Middlesex,	Mass.	Quarantine: its Effects and Necessity.
Jackson, John D.	Danville,	Boyle,	Ky.	Vis Conservatrix et Medicatrix Naturæ.
James, A. W.	Hanging Rock,	Lawrence,	Ohio.	Miasmatic Remittent Fever.
James, John M.	Vicksburg,	Warren,	Miss.	Habitual Constipation.
Jarratt, Jerome S.	Holly Springs,	Marshall,	Miss.	Pneumonia modified by Malaria.
Jennings, Clement A.	Church Hill,	Halifax,	Va.	Acute Gastritis.
Johnson, Thos. W.	Nassau N. P.,	Harbor Island,	Bahamas.	Acute Rheumatism.
Jones, Chas. W.	Dover,	Kent,	Del.	Inflammation.
Jones, John W.	Tarborough,	Edgecombe,	N. C.	Vasa Capillaria.
Kile, Hiram	Irontown,	Lawrence,	Ohio.	Typhus Fever.
Knight, Chas. W.	Tarborough,	Edgecombe,	N. C.	Morbus Coxarius.
Kollock, John M.	Greenwich,	Cumberland,	N. J.	Euonymus Atropurpura.
Landram, Thos. D.	Mt. Pleasant,	Spottsylvania,	Va.	Placenta Prævia.
Le Conte, James	Macon,	Bibb,	Ga.	Inflammation.
Lesley, Wm. Wood	Philadelphia,		Pa.	Remittent Fever.
Little, J. Russell (M.D.)	Pembroke,	Merrimac,	H. N.	Relation of Mind and Body.
Longabaugh, N. H.	Norristown,	Montgomery,	Pa.	Hemorrhage.
Losch, Henry	Philadelphia,		Pa.	Etiology considered from a Philosophical and Psychological point of view.
Lowry, Triplett E.	Lowry,	Bedford,	Va.	Menstruation.
Lyon, Samuel E.	Leesburg,	Washington,	Tenn	Scarlatina.
Magee, James I.	Chester,	Delaware,	Pa	Inflammation.
Maney, Hardy James	Franklin,	Williamson,	Tenn.	Anatomy of the Eye.
Markley, Arthur D.	Phœnixville,	Chester,	Pa.	Abortions.
Martin, Alfred J.	Allentown,	Lehigh,	Pa.	Cynanche Trachealis.
McCorkle, Alfred L. (M. D.)	Lexington,	Rockbridge,	Va.	Lithuria and Oxaluria.
McLeod, Geo. I.	Wellsboro',	Tioga,	Pa.	Intramural Interments.
McMahon, F. S. S.	Courtland,	Lawrence,	Ala.	Asphyxia.
Mellick, Wesley	Light Street,	Columbia,	Pa.	Indigestion.
Merritt, Daniel S.	Philadelphia,		Pa.	The Sense of Vision.

NAME.	TOWN OR P. O.	COUNTY.	STATE.	SUBJECT OF THESIS.
Mock, Andrew L.	Clemmonsville,	Davidson,	N. C.	Colo-rectitis.
Monette, Wm. E.	Vicksburg,	Warren,	Miss.	Acute Gastritis.
Morgan, Geo. H.	Wysox,	Bradford,	Pa.	Morbus Regius.
Mott, Alex. B. (M. D.)	New York City,		N. Y.	Hernia.
Myers, Arthur P.	Sumpterville,	Sumpter,	Ala.	Human Family Diversities, and Causes of those Diversities.
Nash, Thos. S.	Elizabeth City,	Pasquotank,	N. C.	Irritative Fever.
Norcom, Wm. A. B.	Edenton,	Chowan,	N. C.	Acute Gastritis.
Oliver, Wm. A.	Dunnsville,	Essex,	Va.	Menstruation.
Oliver, Wm. J.	Tallahassee,	Leon,	Fla.	Diseases of Wakulla County, Florida.
Owen, Goronwy	Mobile,	Mobile,	Ala.	Yellow Fever.
Parker, Rich. E.	Gatesville,	Gates,	N. C.	Rubeola.
Pitts, Aaron B.	Shop Springs,	Newby Dist.,	S. C.	Opium.
Pugh, Thos. C.	Williamston,	Martin,	N. C.	Pain.
Redondo, Pedro	Havana,		Cuba.	Menstruation a Necessary Function.
Reid, Wm. T.	Crawfordsville,	Taliaferro,	Ga.	Microscope.
Reily, Geo. W.	Harrisburg,	Dauphin,	Pa.	Fœticide, or Criminal Abortion.
Riddick, Reuben B.	Gatesville,	Gates,	N. C.	Specific Urethritis.
Robinson, Augustus	Annapolis,	Nova Scotia.		The Physiology and Anatomy of the Pancreas.
Roedel, Henry H.	Lebanon,	Lebanon,	Pa.	Hysteria.
Rossel, Alfonso A.	Flewelling's X Roads,	De Soto,	Miss.	Acute Gastritis.
Ruffin, John K.	Graham,	Alamance,	N. C.	Anatomy and Physiology of the Pancreas.
Satterfield, Gustavus A.	Santa Fé,	Maury,	Tenn.	Cholera Infantum.
Saville, Henry M.	South Boston,	Suffolk,	Mass.	Idiocy.
Schell, Henry S.	Philadelphia,		Pa.	Phthisis.
Schoales, Jos. D.	Philadelphia,		Pa.	Digestion of the Amylacea.
Seehorn, J. W.	Watauga Bend,	Washington,	Tenn.	Typhoid Fever.
Sheppard, Nicholas C.	Curdsville,	Buckingham,	Va.	Enteric Fever.
Sherk, John L.	Lebanon,	Lebanon,	Pa.	Dropsy after Scarlatina.
Shimer, Jacob S.	Shimersville,	Lehigh,	Pa.	Chemical and Therapeutical Application of Electricity.
Shippen, Edward	Philadelphia,		Pa.	Reid's Plan of reducing Luxation of Femur on the Dorsum Ilii.
Smith, Elliott	Vicksburg,	Warren,	Miss.	Bilious Remittent Fever.
Smith, Jos. E.	Pineville,	Bucks,	Pa.	Icterus.
Smith, Wm. C.	Averasboro',	Harnette,	N. C.	The Effects of the Imagination in Production and Cure of Disease.
Sommerville, James M.	Philadelphia,		Pa.	Cholera Morbus.
Stanton, David (M. D.)	New Brighton,	Beaver,	Pa.	Nitras Argenti in Cholera Infantum.
Sutphen, P. Theod.	Pluckemin,	Somerset,	N. J.	Cathartics.
Tatum, Robert F.	Oak Park,	Madison,	Va.	Dyspepsia.
Taylor, Rich. H. (M.D.)	Memphis,	Shelby,	Tenn.	Physician's Mission.
Terry, Henry	Halifax C. H.,	Halifax,	Va.	Syphilis.
Thompson, Sidney	Milroy,	Mifflin,	Pa.	Physician's Mission.
Thompson, Wm. S. (M. D.)	Pleasant Grove,	Lancaster,	Pa.	An Abnormal Condition of the Female Organs of Generation.
Tryon, John S.	Rehrersburg,	Berks,	Pa.	Traumatic Tetanus.
Waddy, D. T. (M. D.)	Lovelaceville,	Ballard,	Ky.	Enteric Fever.
Wallace, Wm.	Fredericksburg,	Spottsylvania,	Va.	Catamenia.
Warne, Jas. H.	Nashville,	Davidson,	Tenn.	Oxygen Gas.
Watkins, Wm. J.	Young's X Roads,	Granville,	N. C.	Enteric Fever.
Wharton, Alfred	Philadelphia,		Pa.	Inguinal Hernia.

NAME.	TOWN OR P. O.	COUNTY.	STATE.	SUBJECT OF THESIS.
Whyte, Thos. E	Chapel Hill,	Orange,	N. C.	Hypochondriasis.
Williams, Samuel R.	Monticello,	Jefferson,	Fla.	Hypochondriasis.
Wilson, William L.	Nashville,	Davidson,	Tenn.	Laws of Generation.
Winder, Wm. N. J.	Drummondtown,	Accomack,	Va.	Tuberculosis.
Winstead, John H.	Joyners,	Wilson,	N. C.	American Turpentine and its Oil.
Withers, John W.	Madison Depot,	Madison,	Ala.	Puerperal Peritonitis.
Wood, Granville B.	Pleasant Grove,	Lancaster,	Pa.	Urinary Deposits.
Young, Santford C.	Garrettsburg,	Christian,	Ky.	Scurvy.

At a public Commencement, held July, 1856, the Degree of Doctor of Medicine was conferred on—

NAME.	TOWN OR P. O.	COUNTY.	STATE.	SUBJECT OF THESIS.
Walter G. Garth,	Charlottesville,	Albemarle,	Va.	Circulation of the Blood.
Franklin Eads,	Hobbie,	Sumpter,	Ala.	Remittent Fever.
John L. Ivey,	Weldon,	Halifax,	N. C.	Acute Bronchitis.
William M. Scott,	Norristown,	Montgomery,	Pa.	Fracture.
Th. George Morton,	Philadelphia,		Pa.	Cataract.

Total, 154.

R. E. ROGERS, M. D., *Dean.*

UNIVERSITY OF PENNSYLVANIA—MEDICAL DEPARTMENT.

NINETY-SECOND SESSION (1857–58).

The Lectures will commence on Monday, October 12, and continue until the middle of March.

ROBERT HARE, M. D., Emeritus Professor of Chemistry.
WILLIAM GIBSON, M. D., Emeritus Professor of Surgery.

SAMUEL JACKSON, M. D., Professor of Institutes of Medicine.
GEORGE B. WOOD, M. D., Professor of Theory and Practice of Medicine.
HUGH L. HODGE, M. D., Professor of Obstetrics and the Diseases of Women and Children.
JOSEPH CARSON, M. D., Professor of Materia Medica and Pharmacy.
ROBERT E. ROGERS, M. D., Professor of Chemistry.
JOSEPH LEIDY, M. D., Professor of Anatomy.
HENRY H. SMITH, M. D., Professor of Surgery.

WILLIAM HUNT, M. D., Demonstrator of Anatomy.

Clinical Instruction is given at the Pennsylvania Hospital, and at the Philadelphia Hospital.

Clinical instruction is also given, throughout the Session, in the Medical Hall, by the Professors.

The Dissecting Rooms, under the superintendence of the Professor of Anatomy and the Demonstrator, are open after the middle of September.

Fees for the Lectures (each Professor $15)	$105
Matriculation Fee (paid only once)	5
Graduation Fee	30

R. E. ROGERS, M. D., *Dean of the Medical Faculty, University Building.*

F. B. DICK, *Janitor, University Building.*

JEFFERSON MEDICAL COLLEGE.

THE Course of Lectures will commence on Monday, the 12th of October, and continue until the 1st of March.

THOS. D. MÜTTER, M. D., Emeritus Professor of Surgery.
ROBERT M. HUSTON, M. D., Emeritus Professor of Materia Medica and General Therapeutics.

Institutes of Medicine, etc., ...	By Prof. ROBLEY DUNGLISON, M. D.
General, Descriptive and Surgical Anatomy, .	" JOSEPH PANCOAST, M. D.
Practice of Medicine, ...	" J. K. MITCHELL, M. D.
Obstetrics and Diseases of Women and Children,	" CHARLES D. MEIGS, M. D.
Chemistry, ...	" FRANKLIN BACHE, M. D.
Institutes and Practice of Surgery, . .	" SAMUEL D. GROSS, M. D.
Materia Medica and General Therapeutics,	

Demonstrator of Anatomy, . . ELLERSLIE WALLACE, M. D.

Every Wednesday and Saturday in the month of October, and during the course, Medical and Surgical cases will be investigated, prescribed for, and lectured on before the Class. During the year ending March the first, 1857, about *sixteen hundred* cases were treated, and about *two hundred* operations were performed; amongst them many major operations—as amputation of the thigh and leg, extirpation of the upper jaw, mammæ, &c., lithotomy, trephining, resection of the elbow-joint, and ligation of the external iliac artery.

The lectures are so arranged as to permit the student to attend the medical and surgical practice and lectures at the Pennsylvania Hospital.

On and after the 1st of October, the dissecting rooms will be open, under the direction of the Professor of Anatomy and the Demonstrator.

FEES:

Matriculation, which is paid only once, ...	$ 5
To each Member of the Faculty $15, ...	105
Graduation, ...	30

ROBLEY DUNGLISON, M. D.,
Dean of the Faculty.

PHILADELPHIA, June, 1857.

PHILADELPHIA COLLEGE OF MEDICINE.

FIFTH STREET, BELOW WALNUT.

SESSION 1857-8.

FACULTY.

ALFRED T. KING, M. D., Emeritus Professor of Practice of Medicine.

GEORGE HEWSTON, M. D., Professor of Anatomy.
B. HOWARD RAND, M. D., " Medical Chemistry.
HENRY HARTSHORNE, M. D., " Practice of Medicine.
LEWIS D. HARLOW, M. D., " Obstetrics, &c.
WILLIAM S. HALSEY, M. D., " Surgery.
W. HEMBEL TAGGART M. D., " Materia Medica.
JAMES AITKEN MEIGS, M. D., " Institutes of Medicine.

WILLIAM BRADLEY, M. D., Demonstrator of Anatomy.

FEES: Matriculation, $5; one Full Course, $100; Perpetual Ticket, $150; Graduation, $30; Practical Anatomy, $10; Material for Dissection, *free*. Second course Students are furnished with the Hospital Ticket *without charge*. Lectures will commence early in October, and terminate in March. Hereafter this College will have but *one* Commencement annually; the Summer Lectures being made supplementary, only, to the Winter Course.

For further information, address B. HOWARD RAND, M. D., *Dean.*

PENNSYLVANIA COLLEGE—MEDICAL DEPARTMENT.

SESSION OF 1857–58.

The regular Course of Lectures will commence on Monday, October 12th, and will be continued until the 1st of March.

FACULTY.

DAVID GILBERT, M. D.,	Professor of Obstetrics and Diseases of Women and Children.
ALFRED STILLÉ, M. D.,	Professor of Theory and Practice of Medicine.
JOHN NEILL, M. D.,	Professor of Surgery.
JOHN J. REESE, M. D.,	Professor of Medical Chemistry.
JOHN B. BIDDLE, M. D.,	Professor of Therapeutics and Materia Medica.
FRANCIS G. SMITH, M. D.,	Professor of Institutes of Medicine.
T. G. RICHARDSON, M. D.,	Professor of General and Special Anatomy.

H. W. DE SAUSSURE FORD, M. D., }
J. FRANK BELL, M. D., } Demonstrators of Anatomy.

The Students of Pennsylvania College—*both first course and second course*—will be furnished *gratuitously* with the ticket to the Pennsylvania Hospital. A Clinic will also be held at the College, every Wednesday and Saturday morning throughout the session.

FEES.

For the entire Course of Lectures	$105 00
Matriculation (paid once only)	5 00
Graduation	30 00

The Dissecting Rooms will be opened in September, under the direction of the Professor of Anatomy.

Preliminary Lectures will be delivered during the fortnight preceding the opening of the session.

FRANCIS G. SMITH, M. D., *Registrar,*
July, 2t. *No.* 1504 *Walnut Street, Philadelphia.*

OGLETHORPE MEDICAL COLLEGE,

SAVANNAH, GEORGIA.

The regular course of Lectures in this Institution will commence on Monday, November 2, and continue four months. A preliminary course will commence on the 20th October.

The requirements for graduation are similar to those of other Medical Colleges in the United States.

Students will have ample clinical instruction, and surgical operations are always performed before the class when practicable.

A very liberal Beneficiary foundation is established in the College.

Good board may be had at from $3 50 to $5 00 per week.

FACULTY.

HOLMES STEELE, M. D., Dean,	Professor of Obstetrics and Diseases of Women and Children.
J. S. MOREL, M. D.,	Professor of Anatomy.
H. L. BYRD, M. D.,	Professor of Principles and Practice of Medicine.
J. W. BENSON, M. D.,	Professor of Principles and Practice of Surgery.
J. R. SMITH, M. D.,	Professor of Physiology and General Pathology.
IRA E. DUPREE, M. D.,	Professor of Materia Medica and Medical Jurisprudence.
JULES LE HARDY, M. D.,	Professor of Chemistry and Pharmacy.
HUGH A. BLAIR, M. D.,	Demonstrator of Anatomy.

FEES.

For the full course	$105 00
Demonstrator	10 00
Matriculation	5 00
City Hospital (optional)	5 00
Diploma	30 00

2t.

UNIVERSITY OF LOUISIANA—MEDICAL DEPARTMENT.

The Annual Course of Lectures in this department will commence on Monday, November 17, 1856, and will terminate in the ensuing March.

James Jones, M. D.,	Professor of Practice of Medicine.
J. L. Riddle, M. D.,	Professor of Chemistry.
Warren Stone, M. D.,	Professor of Surgery.
A. H. Cenas, M. D.,	Professor of Obstetrics.
Gustavus A. Nott, M. D.,	Professor of Materia Medica.
J. C. P. Wedebstrandt, M. D.,	Professor of Anatomy.
Thomas Hunt, M. D.,	Professor of Physiology and Pathology.
Gilbert S. Vance, M. D.,	Demonstrator of Anatomy.

The rooms for Dissecting will be open on the third Monday in October.

The Faculty are Visiting Physicians and Surgeons of the Charity Hospital, and attend this Institution from November to April.

The Students accompany the Professors in their visits, and, free of expense, enjoy extraordinary practical advantages.

There are, during the season, about eight hundred persons prescribed for daily.

Preliminary to the Course, Lectures will be delivered daily in the amphitheatre of the Hospital, from the first Monday in November, on Clinical Medicine and Surgery, Auscultation and Percussion, and other subjects, without any charge to students.

THOMAS HUNT, M. D., *Dean.*

The Administrators of the Charity Hospital elect annually, in April, fourteen Resident Students, who are maintained by the Institution.

MEDICAL COLLEGE OF VIRGINIA.

SESSION OF 1857-'58.

The regular Course of Lectures will commence on the 1st of October, and continue until the 1st of March.

Charles Bell Gibson, M. D.,	Professor of Surgery and Surgical Anatomy.
David H. Tucker, M. D.,	Professor of Theory and Practice of Medicine.
Martin P. Scott, M. D.,	Professor of Chemistry and Pharmacy.
Beverley R. Wellford, M.D.,	Professor of Materia Medica and Therapeutics.
Arthur E. Peticolas, M. D.,	Professor of Anatomy.
Levin S. Joynes, M. D.,	Professor of Institutes of Medicine and Medical Jurisprudence.
James H. Conway, M. D.	Professor of Obstetrics and Diseases of Women and Children.
Marion Howard, M. D.,	Demonstrator of Anatomy.

The study of Practical Anatomy may be prosecuted with the most ample facilities, and at a very trifling expense.

The Infirmary, under the same roof with the College, is at all times well filled with Medical and Surgical cases, and furnishes peculiar advantages for Clinical Instruction. Many Surgical Operations are performed in the presence of the Class, and the Students, being daily admitted to the wards, enjoy, under the guidance of the Professors, unusual opportunities for becoming familiar, not only with the symptoms and diagnosis of disease, but with its daily progress and treatment. Students also enjoy the Clinical advantages afforded by the Richmond Almshouse.

FEES.

For the entire Course of Lectures	$105
Practical Anatomy	10
Matriculation Fee	5
Graduation Fee	25

L. S. JOYNES, M. D.,
Dean of the Faculty.

April, 1857.—3t.

MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA.

The annual Course of Lectures in this Institution will commence on the *second Monday in November*, on the following branches:—

Anatomy	J. E. Holbrook, M. D.
Surgery	E. Geddings, M. D.
Institutes and Practice	S. Henry Dickson, M. D.
Materia Medica	Henry R. Frost, M. D.
Obstetrics	Thomas G. Prioleau, M. D.
Chemistry	C. U. Shepard, M. D.
Demonstrator of Anatomy	Francis T. Miles, M. D.
Prosector to the Professor of Surgery	J. F. M. Geddings, M. D.

D. J. Cain, M. D., Physician to the Marine Hospital and Clinical Instructor, lectures twice a week on the diseases of that Institution.

At the *Roper Hospital* Clinical Lectures are delivered twice a week by the Physician and Surgeon of the Institution, and operations performed before the class in the Amphitheatre of the Hospital.

The *Faculty Ward in the Roper Hospital*, by the conveniences which have been furnished, is a valuable addition to the surgical practice of the city. Operations are performed before the class, and students have opportunities of being made familiar with the subsequent treatment.

The Anatomical Rooms will be opened in October, and dissections conducted daily by the Demonstrator. Much attention is directed to this department; the material being abundant, and illustrations of a varied character being afforded for acquiring a competent knowledge of this very important branch.

The Faculty of the Medical College of the State of South Carolina take pleasure in calling the attention of the friends of the Institution to its present prosperous condition. They have been enabled, by the liberality of the Legislature, to make such alterations in extending and improving the College building as will promote materially the comfort of those in attendance on the Lectures.

The Anatomical Theatre has been enlarged and completely renovated, and such changes made as will secure free ventilation, with a pleasant arrangement of the seats. They confidently believe that it will not suffer in comparison with any like structure in the United States, the edifice, with its appurtenances, being as commodious and attractive as any such establishment in the country. By the same appropriation of the Legislature, they have been enabled to make considerable addition to the Museum of the College.

In the Surgical department considerable additions have been made in drawings, plates, &c., and the collection of articles in the Materia Medica has been made very extensive and complete.

HENRY R. FROST, *Dean.*

PREMIUM OFFERED BY THE PROFESSOR OF SURGERY.

The undersigned, Professor of Surgery in the Medical College of the State of South Carolina, with the view of encouraging diligence of study, and promoting a greater spirit of scientific investigation and research, offers to the graduating class, for the ensuing year, two prizes, of the value of one hundred dollars each, for the two best essays on the following subjects, and under the restrictions subjoined, viz:—

1. For the best essay on a surgical subject a prize of one hundred dollars.
2. For the best essay on the Anatomy, Physiology, and Pathology of the Suprarenal Capsules, a prize of one hundred dollars.

It is expected that these essays shall contain a full and faithful digest of the existing knowledge on the subject; that they shall, as far as possible, be enriched by original observations and suggestions, and shall be written in the English language.

Such essay is to be separate and independent of that which is required by the Faculty for graduation.

Each essay presented must be accompanied by a sealed packet, containing a motto corresponding to one indorsed on the essay, which former will only be opened in that to which the prize may be adjudged.

All essays must be handed in on or before the 15th day of February, when they will be placed before a disinterested committee for the adjudication of the prizes.

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Prof. of Surgery in Med. College of the State of South Carolina.

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BROWN ON THE SURGICAL DISEASES OF FEMALES, with wood-cuts.

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Communications have been received from Drs. CASSELBERRY, DOWELL, BARBER, SHEPHERD, KING, MCRAE, and RED, which shall receive early attention.

The following works have been received:—

On Gastro-colic Fistula. A Collection of Cases and Observations on its Pathology, Diagnosis, &c. By CHARLES MURCHISON, M. D., &c. &c. Edinburgh, 1857. (From the Author.)

Elements of Pathological Anatomy. By SAMUEL D. GROSS, M. D., Professor of Surgery in the Jefferson Medical College of Philadelphia, and formerly Professor of Pathological Anatomy in the Medical Department of the Cincinnati College. Third edition, modified and thoroughly revised; illustrated by three hundred and forty-two engravings on wood. Philadelphia: Blanchard & Lea, 1857. (From the Publishers.)

Fiske Fund Prize Essays: The Effects of Climate on Tuberculous Disease. By EDWIN LEE, M. R. C. S. London. The Influence of Pregnancy on the Development of Tubercles. By EDWARD WARREN, M. D., of Edenton, N. C. Philadelphia: Blanchard & Lea, 1857. (From the Publishers.)

General Therapeutics and Materia Medica; adapted as a Medical Text-Book, with Indexes of Remedies, and of Diseases and their Remedies. By ROBLEY DUNGLISON, M. D., LL.D., Prof. Ins. Med. Jeff. Med. Col. With 193 illustrations. Sixth edition, revised and improved; in two volumes. Philadelphia: Blanchard & Lea, 1857. (From the Publishers.)

The Practice of Surgery. By JAMES MILLER, F. R. S. E., F. R. C. S. E., Prof. of Surg. in Univ. of Edinburgh, etc. etc. etc. Revised by the American Editor. Fourth American from the last Edinburgh edition. Illustrated by 364 engravings on wood. Philadelphia: Blanchard & Lea, 1857. (From the Publishers.)

A Theoretical and Practical Treatise on Midwifery, including the Diseases of Pregnancy and Parturition, and the attentions required by the Child from Birth to the period of Weaning. By P. CAZEAUX, Adj. Prof. in Fac. Med. of Paris. Second American edition, translated from the fifth French edition by WM. R. BULLOCK, M. D. With 140 illustrations. Philadelphia: Lindsay & Blakiston, 1857. (From the Publishers.)

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Transactions of the Second Session of the Medical Society of the State of California, convened at Sacramento Feb. 11, 1857. Sacramento, 1857. (From Dr. T. M. Logan.)

Proceedings of the Sixty-Fourth Annual Convention of the Connecticut Medical Society, May, 1857. Hartford, 1857.

Transactions of the Medical Society of the State of New York. (Transmitted to the Legislature Feb. 9, 1857.) Albany, 1857.

Transactions of the Indiana State Medical Society at its Eighth Annual Session held in the city of Indianapolis, May 19, 1857. Indianapolis, 1857.

Transactions of the Eighth Annual Meeting of the Medical Society of the State of North Carolina, held at Edenton, N. C., April, 1857. Wilmington, 1857.

Transactions of the New Hampshire Medical Society (sixty-seventh anniversary), held at Concord, June 2 and 3, 1857. Concord, 1857. (From Dr. T. J. W. Pray.)

Annual Report of the Commissioners of Emigration of the State of New York, with the Medical and Surgical Reports for the year ending Dec. 31, 1856. New York, 1857.

Report on the Origin of the Yellow Fever in Norfolk during the Summer of 1855, made to City Councils by a Committee of Physicians. Richmond, Va., 1857.

Report on the Vital Statistics of the United States, made to the Mutual Life Insurance Company of New York. By JAMES WYNNE, M. D., etc. New York, 1857. (From the Author.)

Life—its Relations, Animal and Mental; an Inaugural Dissertation. By J. DICKSON BRUNS, A. M , M. D. Charleston, 1857. (From the Author.)

Reports of the Trustees and Superintendent of the Maine Insane Hospital, Dec. 1856. Augusta, 1856.

Thirtieth Annual Report of the Directors of James Murray's Royal Asylum for Lunatics, near Perth. June, 1857. Perth, 1857.

Ninth Annual Report of the Massachusetts School for Idiotic and Feeble-minded Youth. Boston, 1857.

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History and Treatment of Vesico-Vaginal Fistula: a Report read before the Medical Society of the State of Georgia at their Annual Meeting at Augusta, April 8, 1857. By P. M. KOLLOCK, M. D., Professor of Obstetrics and Diseases of Women and Children in the Savannah Medical College, and Member of the American Medical Association. Augusta, 1857. (From the Author.)

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Early History of the Operation of Ligature of the Primitive Carotid Artery; with a Report of Forty-eight Unpublished Cases, and a Summary of Forty-four Cases; with Remarks by VALENTINE MOTT. By J. R. WOOD, M. D. New York, 1857. (From the Author.)

On the Successful Treatment of Hydrarthrosis of the Knee-joint by Puncture and Injection of Iodine. By R. L. MAC DONNELL, M. D. Montreal, 1857. (From the Author.)

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Annual Circular and Report of the New Orleans School of Medicine, chartered May, 1856.

Thirty-Eighth Annual Announcement of Lectures of the Medical College of Ohio for the Session of 1857–8, and Catalogue of Students and Graduates of the Medical College of Ohio and Miami Medical College for the Sessions of 1856–7. Cincinnati, 1857.

Report and Announcement of the Medical Department of the University of Pennsylvania for the Session of 1857–8. Philadelphia, July, 1857.

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Le Moniteur des Hôpitaux Revue Médico-Chirurgicale de Paris. Redacteur en chef, M. H. De Castleneau. June, July, August, 1857.

Annales Médico-Psychologiques. Par MM. les Docteurs Baillarger, Cerise, et Moreau (de Tours). July, 1857.

Journal de Médecine de Bordeaux. Redacteur en chef, M. Costes. July, 1857.

Revue de Thérapeutique Médico-Chirurgicale. Par A. Martin Lauzer. January, February, March, April, May, June, July, August, 1857.

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L'Art Dentaire Revue Mensuelle de la Chirurgie et de la Prothese Dentaires. Par MM. Fowler et Preterre, Dentistes Américaines à Paris. June, July, 1857.

The British and Foreign Medico-Chirurgical Review. July, 1857.

The Half-Yearly Abstract of the Medical Sciences. By W. H. Ranking, M. D. and C. Radcliffe, M. D. January, June, 1857.

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British Medical Journal. Edited by Andrew Winter, M. D. July, August, September, 1857.

The Dublin Hospital Gazette. June, July, August, 1857.

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The Sanitary Review and Journal of Public Health. Edited by B. W. Richardson, M. D. July, 1857.

The Glasgow Medical Journal. July, 1857.

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The New York Journal of Medicine. Edited by Stephen Smith, M. D. July, September, 1857.

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Iowa Medical Journal. Edited by Drs. Hughes and Marsh. May, June, July, August, 1857.

The Peninsular Journal of Medicine. Edited by Drs. Pitcher, Palmer, Brodie, and Christian. July, August, 1857.

Atlanta Medical and Surgical Journal. July, September, 1857.

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